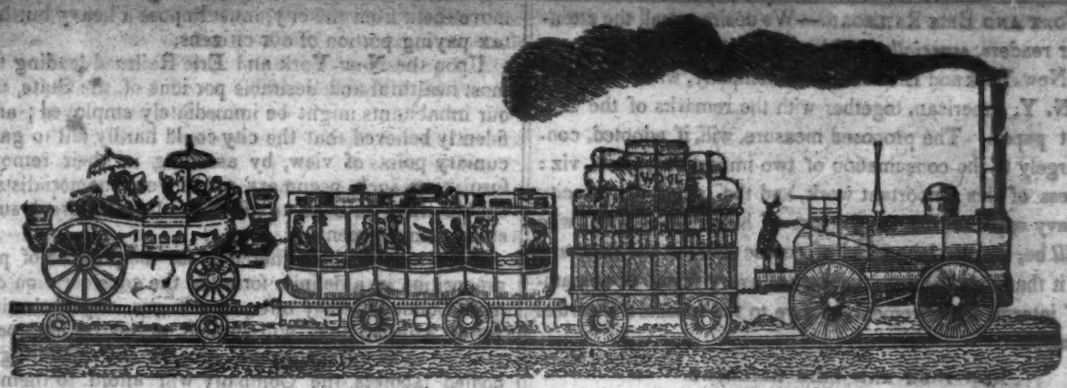

AMERICAN RAILROAD JOURNAL,
AND ADVOCATE OF INTERNAL IMPROVEMENTS.

PUBLISHED WEEKLY, AT NO. 30 WALL STREET, NEW-YORK, AT FIVE DOLLARS PER ANNUM, PAYABLE IN ADVANCE.

D. K. MINOR, and GEORGE C. SCHAEFFER, } Editors and Proprietors.] SATURDAY, JUNE 24, 1837. [VOLUME VI—No. 25.

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AMERICAN RAILROAD JOURNAL.

NEW-YORK, JUNE 24, 1837.

Hudson and Berkshire Railroad.—At an election for Directors of the Hudson and Berkshire Railroad, held on the 5th inst., the following gentlemen were elected, viz:

James Mellen,	William A. Dean,
Elihu Gifford,	Robert A. Barnard,
Rufus Reed,	Oliver Wiswall,
Governeur Kemble,	Silas Sprague,
Samuel Anable,	Ambrose L. Jordan,
Robert McKinstry,	Seneca Butts,
John Power.	

We are gratified to learn, as we do, from the following extract from a letter that this road is ready for the rails.

"Our road is all graded, except 1½ miles, and that portion far advanced. The road would have been in operation this season, had not these fearful times prevented."

☞ It was by no means *intended* as "partiality," that the report in relation to this road was not published, if it was received, of which we have no recollection.

We give the following communication of "A Merchant," in relation to the important proposition of the New-York and Erie Railroad Company, to the Common Council—and cordially approve of his suggestion for the call of a meeting of citizens for some evening of this week, for the purpose of laying the subject before them, and of eliciting an expression of opinion from those who are to be most effected by it. That such an expression of opinion would be highly favorable we cannot doubt, and of course satisfactory to the *people's representatives*, the Common Council.

We do not entertain a doubt, as to the result of the proposition; as, to doubt its success, would be to doubt the intelligence, and enlightened forecast of the gentlemen who compose that body.

To the Editors of the Railroad Journal.

Gentlemen.—I perceive by the Times of this morning that a very important proposition was made to the Common Council on Monday evening last, by the *New-York and Erie Railroad Company*.

It will be seen, by referring to the memorial of the President and Secretary, in behalf of the Railroad Company, that they ask the Corporation of New-York, to aid the Company, either by *subscription* to its stock, or by *loan;* and offer in return to employ at least 3000 laborers from this city, if the Corporation will place them along the line of the road by the first of August. This is a measure of great importance to this city, in more than one point of view.

It will in the first place relieve the city from an enormous burthen, by employing many who are now, or must soon be, supported by the city.

It will enable hundreds of industrious, and honest men, to earn a living, instead of being degraded, in their *own* estimation by the *necessity of asking charity.*

It will contribute largely to the prevention of vice and crime, by removing from the city hundreds of families who must either *beg, steal* or *starve*—and it is therefore a measure, the adoption of which is urged alike by *humanity* and self-interest. In addition to these important reasons it will contribute largely to the progress of a work in which this city has a deep and lasting interest. It will, beyond all question, ensure and hasten the early completion of the New-York and Erie Railroad, a work, second only—*if even second*—in importance to *this city*, to the Erie Canal.

With these views, gentlemen, of the importance of the proposition, as a matter of policy and pecuniary interest to the city, I cannot refrain from requesting you to urge the subject upon the Common Council, and also upon the citizens at large, as one on which there should be *no diversity of opinion.*

Would it not be well to call a public meeting of the citizens at large, for Saturday evening, that the subject may be publicly discussed, and properly understood, in time for the next meeting of the Common Council?

Truly yours,

A Merchant.

NEW-YORK AND ERIE RAILROAD.—We desire to call the attention of our readers, *especially in this city*, to the following memorial of the New-York and Erie Railroad Company, which we copy from the N. Y. American, together with the remarks of the Editor of that paper. The proposed measure, will, if adopted, contribute largely to the consumation of two important objects, viz: the progress of this important work, and the relief of the city from a heavy expense, for the support of hundreds of men, who are, or *will* be, without labor, and of course without the means of support; it therefore becomes the duty of every friend of humanity, and of internal improvement, to give to the measure a cordial efficient support.

NEW-YORK AND ERIE RAILROAD.

The following memorial, presented to the Common Council last evening, seems to us amazingly well calculated to effect two good objects: that of finding employment for several thousand laborers, who, or many of whom, may otherwise become a charge to this city; and that of aiding a great national undertaking, in the success of which this city again has a very deep interest, and which, without some such plan, must languish at least for the present.

As a matter merely of economical calculation, we take it, that our tax-payers would gain by such an arrangement as is proposed, viz.; that the Corporation shall advance its credit to the New-York and Erie Railroad Company, on condition of their giving employment to 3,000 men; the wages thus paid, while providing a fund that would supercede all necessity of, or claim for, eleemosynary relief from this city on the part of such large numbers, would, in effect, be like seed sown in the ground, and re-produce threefold benefits, to the city, to the counties through which the road runs, and to the laborers themselves.

Nor would any advance of city funds be required, for the credit of the Corporation would call them forth readily from capitalists.

Altogether, the proposition strikes us as one to which the Common Council will do wisely in acceeding.

To the Mayor, Aldermen, and Commonalty, of the City of New-York.

The New-York and Erie Railroad Company respectfully represent:

That they have completed the surveys of sections of their road between this city and Lake Erie, exceeding in the aggregate 250 miles in length, all which are now ready for actual construction.

Your memorialists had designed to prosecute the work vigorously during the present season, and could have done so with much advantage, labor being cheap, and provisions abundant; they regret, however, to state that the merchants of this city, whose subscriptions had principally supported the enterprise, have suffered so severely in the present prostration of credit and commerce, that your memorialists will be unable, unless they shall secure public aid, to continue their operations during the present year.

It is believed that the city of New-York ought in its incorporate capacity, to exert any legitimate authority it may possess to expedite the progress of this work of improvement, destined as it is to promote so materially the prosperity of all classes of its inhabitants. The question, however how far the public authorities shall follow the example already set by other cities of the Union, in subscribing to the stock of works of improvement designed to protect and extend their commerce, your memorialists do not propose at this time to agitate; and they now present the subject to the consideration of the Common Council, principally because an opportunity at this time presents itself by which the city can effectually aid the enterprise, and at the same time accomplish other objects with which the municipal interests are more directly and peculiarly concerned.

The large numbers of our laboring population thrown out of employment by the commercial disasters which have overtaken the city, are constantly increasing by the influx of destitute emigrants; and it is obvious, that their support through the approaching winter, unless prompt measures can be adopted to remove them from the city, must impose a heavy burthen upon the tax paying portion of our citizens.

Upon the New-York and Erie Railroad leading through the most healthful and desirable portions of the State, this class of our inhabitants might be immediately employed; and it is confidently believed that the city could hardly fail to gain, in a pecuniary point of view, by assisting in their removal, and in furnishing such pecuniary aid to your memorialists as should enable them at once to afford to these laborers sufficient and steady employment.

Your memorialists, therefore, for the purpose of presenting a proposition in a definite form for the consideration of the Common Council, hereby offer, that if the city authorities, by the 1st of August next, will furnish, at convenient points on the railroad to be agreed on, any number not exceeding 3,000 able bodied laborers, the Company will afford to them immediate employment, and at fair rates of wages, subject only to such regulations as may be necessary to secure their faithful services; provided, that the city shall authorize either a temporary loan to the Company, or a subscription to its capital stock, for an amount sufficient to cover the expenditure necessary to carry this proposition into effect.

JAMES G. KING, President
New-York and Erie Railroad Company.
T. J. WATERS, Secretary
New-York and Erie Railroad Company.
New-York, June 19, 1837.

WILMINGTON AND SUSQUEHANNA RAILROAD.—We are happy to learn from the enterprising builder of the Principio Bridge, John Jones, Esq., that it will be finished by the end of next week.—This is the only obstacle of importance in the completion of the road, and we have no hesitation in saying that it will be ready for use by the 4th of July, between this city and Baltimore.—[Del. Gazette.]

From the London Mechanics' Magazine.

SALUBRITY OF RAILWAY TUNNELS. REPORTS ON THE TUNNEL ON THE LEEDS AND SELBY RAILWAY.

REPORT OF DR. DAVY, AND DR. ROTHMAN.

After careful inquiry, and an examination of this Tunnel, we are of opinion that it has no injurious influence on the health of the passengers. We have come to this conclusion from finding:—1st. That the air in the Tunnel at the time of passing is not appreciably vitiated. Chemically examined, its composition appears to be the same as that of the atmosphere, even after repeated transits of the locomotive engines.

2nd. That the temperature of the air in the Tunnel, though more uniform than that of the external air, does not vary so much from it as might have been expected In the warmest weather in which observations have been made, the air of the middle of the Tunnel was only 8 deg. lower than that of the atmosphere, the latter being 70 deg. In February, the greatest difference we found was also 8 deg. the atmosphere then being at 56 deg. We were assured that, during the severest weather of the last winter, the temperature of the Tunnel never fell to the freezing point.

3rd. That the humidity of the air in the Tunnel, judging from the new experiments which we have been able to make, will be more uniform than the temperature. That it will generally be somewhat greater than that of the external air, but never sufficiently so to cause the precipitation of aqueous vapor in the carriages, or on the persons of passengers.

4th. That we have not been able to detect, in any part of the Tunnel, traces of acid, or other irritating or noxious effluvia.

The Tunnel, at present is passed through in darkness, which, though not dangerous, is to many persons unpleasant. This seems to require correction, and it is understood to be in contemplation to attach lamps to the carriages.

The noise made by the engine and train of carriages did not seem to us much greater in the Tunnel than in the open air, nor to form any reasonable ground for complaint. Annexed to this Report is a certificate by Dr. Williamson, a high medical authority in Leeds, generally in accordance with the opinions

above expressed. He has even arrived at the conclusion, which we see no reason to doubt, that travelling on the Railway if often beneficial to persons in delicate health, particularly in certain cases of slight pulmonarary disease.

The Tunnel in question is situated very near the terminus of the Railway in the town of Leeds. It is 700 yards in length, 17 feet high, and 22 broad. Its direction is nearly east and west. The inclination of the floor is 1 in 300. It has three shafts at irregular distances, which now serve the purpose of ventilation. The westermost is somewhat the deepest; the depth of this is 23 yards, measured to the floor of the Tunnel. The Tunnel is bricked throughout its whole extent. It is traversed by 20 engines daily, and on an average by 350 passengers. The average time of passing is about a minute and a quarter. The steam is generated by coke of the best quality, under a pressure of 56 lb., with regard to our sensations in passing through the Tunnel, with the windows of the carriage purposely left down, we experienced nothing unpleasant, either from smoke, vapor, or currents of air. The temperature in the carriage was agreeable, and every thing felt dry.

We would conclude by observing, that the opinions we have expressed of this Tunnel we hold to be applicable to all other Tunnels, the circumstances of which are similar; and to Tunnels of greater length, if they are higher and have a sufficient number of shafts to secure an adequate ventilation.

JOHN DAVY, M. D. F. R. S.
Assistant Inspector of Army Hospitals.
R. W. ROTHMAN, M. A. & L. M.
Fell. Trin. Coll. Camb.

London, 21st February, 1837.

DR. WILLIAMSON'S REPORT.

In reference to the effects of the transit through the Tunnel of the Leeds and Selby Railroad on the health of passengers, I have to state, that in the whole of my experience, both in private practice and in my official connexion with the infirmary, and with the other Medical Institutions of this town, I have never seen a case in which I could ascribe injurious results to that circumstance. I have, indeed, frequently recommended delicate persons to make excursions on the Railroad for the benefit of their health, and have known very decided advantage to accrue from such excursions to persons even laboring under the slighter forms of pulmonary irritation.

I conceive that the vapor, smoke, and gaseous results of combustion can never exist in such proportions as materially to deteriorate the air; and that there is no degree of humidity or deleterious emanation, peculiar to the Tunnel, which can be appreciably detrimental to animal life.

I believe that persons of irritable bronchial membrane may respire in the air of the Tunnel for a considerable period without feeling the slighest inconvenience or sustaining any injury.

(Signed) JAMES WILLIAMSON,
Senior Physician of Leeds General Infirmary, and Lecturer on the Practice of Physic in the Leeds Medical School.

Leeds, 19th February, 1837.

ADHESION OF RAILROAD SPIKES.—We conclude in this number the very important article of Prof. W. R. JOHNSON, from the Journal of the *Franklin* Institute, (it was commenced from the Journal of Science, in which however, we did not find all the engravings,) "*On the Adhesion of Iron Spikes of various forms, etc.*" To Railroad Companies the writer has performed a very acceptable service, and we take great pleasure in giving it publicity in this Journal—and shall always be gratified to give such articles a *first* place in its columns.

Continued from Page 360.

The accompanying figures represent the appearances of timber as developed by splitting the specimens, through the axis of the cavities, left by the spikes when withdrawn.

Figures of Timber.

Fig. 1. Fig. 2.

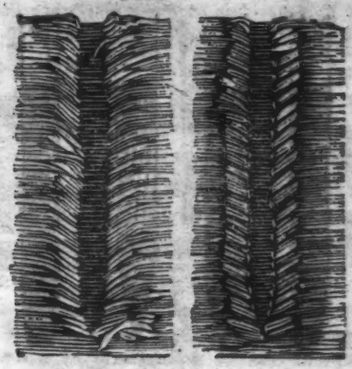


Fig. 3. Fig. 4.

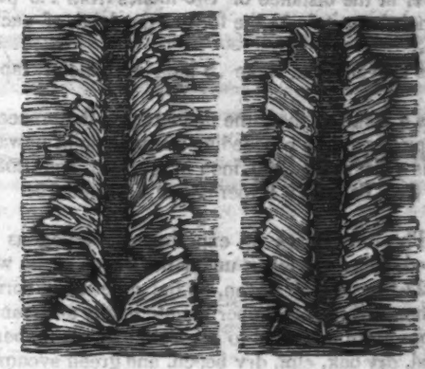


Fig. 1—Is that presented by the locust timber, mentioned in Table II, Experiment 11, in which the weight required to extract the spike was 3990 lbs. The upper part of the figure exhibits the rising up of the timber just as the spike starts. In every case this effect was found, on examining the timber, to have been of very limited extent.

Fig. 2—Represents the grain of chestnut timber as effected in experiment 3, Table III, with the broad flat spike, and other trials. At the point of inflection downwards the grain appears to be not only bent but often actually broken off.

Fig. 3—Exhibits the appearance of a specimen of hemlock timber, used in experiment with the straight grooved spike, (Fig. 4 of spikes) in which the weight required to extract it was but 1296 lbs.—See Table II, Experiment 8th.

Fig. 4—Conveys an idea of the manner in which a defective specimen of pitch pine was affected by a spike. The force required to draw this spike was so trifling that it was not thought worth recording in the tables.

Figures of Spikes.

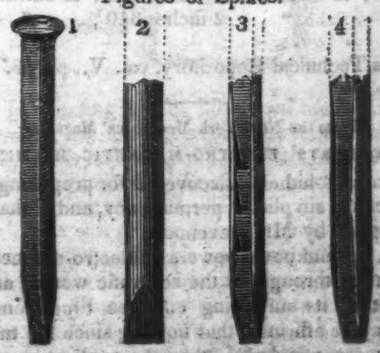


Fig. 1—is a square spike .405 of an inch wide on each face,—referred to in Table III, Experiments 1, 5, and 13.

Fig. 2—is a cylindrical spike .485 inch in diameter, sharpened to a cutting edge—see Table III, Experiment 9.

Fig. 3—is the grooved and notched spike, serrated in the bottoms of the grooves on the two faces.—Table III, Experiment 12.

Fig. 4—is a spike with plane grooves on the faces, extending from the upper part of the bevel to the height of about 3½ inches.

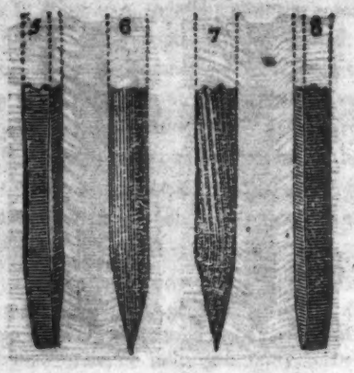


Fig. 5—is a grooved and swelled spike, that is, having the groove deeper at the distance of two inches from the point, than it is at one inch from it. At the former the depth of each groove is .066 inch.

Fig. 6—is a cylindrical spike .5 inch in diameter, tapered to a point.

Fig. 7—is a spike of the same diameter as the preceeding, but having 15 spiral grooves proceeding from the point upward.

Fig. 8—is a flat spike .390 inch in breadth, and .253 inch in thickness. See Table III, Experiments 4, 7, and 15.

NOTE.—The only series of experiments analogous to those above detailed, which has fallen under the notice of the writer was made in 1824,* by Mr. B. Bevan, on the adhesion of sprigs, brads and nails, when driven into timber longitudinally and transversely. His operations were extended to several kinds of timber, viz :—Norway deal, dry oak, elm, dry beech, and green sycamore.

He employed some nails of a very minute size of which 4560 were required to make a pound averdupois. One of these required 22 lbs. to extract it, when driven .4 of an inch into pine board. From this size he advanced by several gradations to the sixpenny wrought nail, of which 73 make a pound averdupois.—Of the latter he drove one to the depth of one inch successively into pine, elm, dry oak, dry beech, and green sycamore, and found the forces required for its extraction to be as follows :

For Pine,	187 lbs.
Elm,	327
Oak,	507
Beech,	667
Sycamore,	312

Mr. Bevan examined, to some extent, the difference between driving a nail by percussion with a hammer of known weight and range of fall, and forcing it into the wood by simple pressure.—This curious inquiry did not for obvious reasons, enter into the plan of the writer of this article. Mr. B. found that to force a sixpenny nail into pine 1 inch, it took a pressure of 235 lbs. ; to extract it, 187 ; to force it in 1½ inch 400 ; to extract it 327 ;
" 2 inches 610 ; " 530.

* See Gill's Technical Repository, vol. V., p 248.

From the New-York Mechanics' Magazine

DAVENPORTS' ELECTRO-MAGNETIC MACHINE.

Of all the means hitherto discovered for propelling machinery, nothing exceeds in sin plicity, permanency, and perhaps in power, that lately applied by Mr. Davenport.

The great, but unknown powers of electro-magnetism, is now arousing atention throughout the scientific world ; and what is to be the result of its surprising energies time alone will determine. It may be affirmed, that nothing since the time of Newton appears more wonderful, than the application of this latent principle to the useful arts. If capable of increase to an unlimited extent, as Prof. Silliman contends, the inventions of Watts and of Fulton, will soon be thrown into the shade ; but of this we have our doubts, the authority of the Professor and many others to the contrary, notwithstanding. Should we, after a careful investigation of the machine, find ourselves mistaken, we shall be prepared to say, that nothing within the history of man, has ever proposed those great and genial advantages to mankind that Davenports' machine does ;—nothing half so safe, so cheap and so efficient. We could see through the vista of years, and point to the almost innumerable purposes to which this astonishing power will be applied in the various pursuits of life. Steam will, of course, remain uninvoked, and the winds will be suffered to pass by unheeded. A new and hitherto unappreciated agent, will be called into activity, and wonderful will be its potency and advantage.

Though now working miracles in matters of science, yet even these will be neglected or forgotten in its ultimate triumph as a motive power. No one will dare to assign limits to its prospective utility. The quiet and unobserved energies of this principle, will all at once be waked from its eternal sleep, and aroused to the most intense action.

The ingenuity of man, after science awakened us to a sense of its active properties, has not long permitted it to exert its influence alone in hidden phenomena, but, as in the case of Mr. Davenports application, it has been brought to the traces and it is now about to put forth its strength in behalf of man, and to work submissively for the gratification of his innumerable wants.

Although the nature, and many of the phenomena of Electro-Magnetism, were long since known, and although the developement of its properties, has steadily progressed for some years past, yet it remained for Mr. Davenport, a Vermont blacksmith, to harness it to the useful arts, and to show to the world how cheap, how safe, and how uniting are its powers. It appears that this ingenious mechanic, first saw a galvanic magnet, about three years since, when struck with astonishment by the power which it exhibited in sustaining a weight of 150 lbs. on being attached to a galvanic battery, he at once drew the inference, yankee-like, that it might be adapted to useful purposes, in the propulsion of machinery. He purchased the magnet, poor as he was, though not without obtaining, even in this incipient step, the assistance of his friends. Various and interesting were the progressive advancements of this unread yeoman, in the production of his designs, and the ultimate production of a rotary motion. In this, however, he succeeded, and the first model was for sometime exhibited among the curious. More recently, models have been made and exhibited in this city, where stock in the patent right, is now offered for sale. The patent is about to be taken out, also in Europe ; and, if we are to give credit to report, the stock is rapidly selling off.

Improvements have repeatedly been made in the mode of generating this power ; and it may be presumed that others may yet be made, so as to increase it without additional expense, and without a corresponding increase in size. The models we have seen are about 8 inches in diameter : they make more than 600 revolutions in the minute, and raise 16 lbs. at the rate of 1 foot in that time. A model is now making of a still larger size, which will more fairly test the question, whether the power can be increased *ad in finitum*. Experiments are also making with fixed and galvanic magnets, in order to determine their relative powers, etc.

It is but proper to add that Prof. Henry, of Princeton College, was the first who applied this power to the movement of machinery by means of a beam, like that of a walking beam of a steam engine, but Mr. D. was alone in producing by this agent a rotary motion.

The former gentleman also succeeded, by a method of galvanic arrangement, peculiarly his own, in exciting a power far beyond that it had been known to possess. Justice, therefore, demands that to these individuals should be awarded the meed of praise which the world may hereafter give the earliest discoverers in this branch of philosophy : though we are aware that numerous experiments have been made of late in Europe to test the applicability and power of this natural agent, as yet, however, without success.

L. D. C.

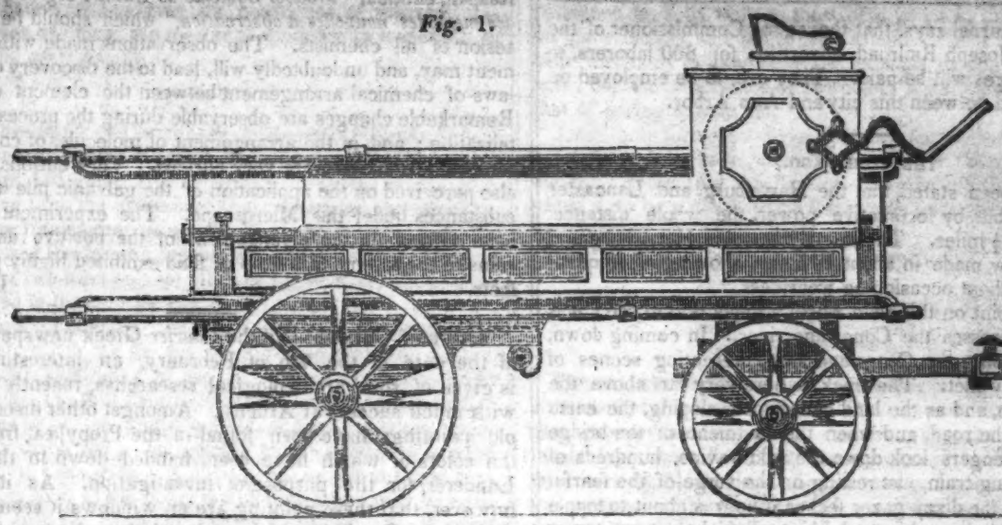
From the London Mechanics' Magazine.

BADDELEY'S HOSE-REEL FOR FIRE ENGINES.

SIR,—Every contrivance, calculated to save time, and in some measure to supercede skilled labor, is at all times valuable, but especially so when adapted to emergent occasions—as, for instance, when applied to such objects as the extinction of fires.

BADDELEY'S HOSE-REEL FOR FIRE-ENGINES.

Fig. 1.



The present form of fire-engines is so convenient, and so exceeding compact, that it is only in the minor details of its arrangements, that there is any room for the exercise of ingenuity.

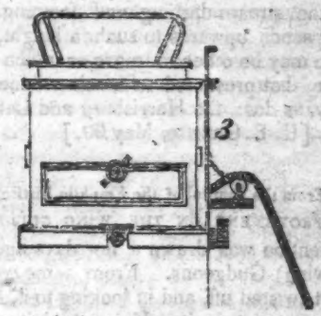
In addition to the several minor improvements, which I have from time to time suggested, I have now to submit another, intended to simplify and facilitate the application of this useful machine to its intended purpose.

As fire-engines are now built, the leather hose is stowed away very conveniently in separate lengths (six lengths and a half being the usual compliment,) in the fore part of the engine. In London and some other places, where the firemen, from continual practice, become amazingly expert in the management of all their apparatus, six, seven, eight, or even a still greater number of lengths of hose, are got out and joined up with astonishing rapidity. It sometimes happens, however, even with the most experienced firemen, when short-handed, that some loss of time occurs in performing this necessary operation. When no regular firemen are employed, as in the case of engines belonging to parishes—to public or private establishments, &c., where only one individual is acquainted with, and has himself to perform the several preparatory evolutions, or entrust their performance to strangers altogether unpractised in matters of this sort—the getting out and joining of any consiberable quantity of hose is a work of much time and labor.

The drawings herewith sent, exhibit a little invention, which I have termed a *hose-reel*; it is intended to have wound upon it a quantity of leather hose already screwed together, so that on arriving at a fire, the engineer has only to take the branch-pipe in one hand, and the end screw of the hose in the other, and run off to any point from which the fire can be successfully opposed; a sufficient length of hose being run out, the next joint is screwed and attached to the engine, which may immediately commence working. The speed with which an engine can thus be brought to bear upon the flames, at some considerable distance, is very great; one joint has to be unmade and another made, when all that is necessary is performed. Whereas, at present, perhaps five or six lengths would have to be taken out of the engine, carried forward, and as many joints made before the engine could be set to work—to say nothing of the uncertainty as to the quantity required, or of the imperfect manner in which the joints are made when done hastily, amid the confusion which always prevails, and perhaps by persons unaccustomed to the office. By using the reel all twisting of the hose is effectually obviated—the joints having been previously made are all perfect, and the connecting screws are preserved from much of the injury to which they are at present exposed.

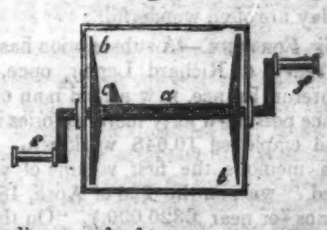
Fig. 1. is a side elevation of a fire-engine of the most approved construction, furnished with the hose-reel, which occupies a space enlarged for the purpose above the cistern and under the driver's seat—the extent and position of the reel being shown by the dotted circle. Fig. 2. is a front representation of the hose-

Fig. 2.



box, by which it will be seen that there is an oblong flap or door, fastened in any convenient manner, with an aperture of such a size as to hold firmly the male screw of the hose. Fig. 3. is a side view of the same, with the hose in the act of being drawn out. A small roller is placed upon the flap for the hose to run in and out upon, the flap being supported horizontally by chains on either side. Fig. 4. shows the construction of the reel; it consist of a hollow spindle *a*, and two circular sides *b b*, of thin sheet iron, the spindle runs in two brass collars in the sides of the hose-box, and at each end there are two square eyes for the insertion of the handles *e f*, by which the hose is wound upon

Fig. 4.



the reel. In winding up the hose, two men stand one on either pocket, another one in front guides the hose backwards and forwards from end to end of spindle. The female screw is in the first instance hitched upon the forked notch *c*, which holds it fast, and on turning round the handles the hose is wound upon the reel There is a pall and ratchet (not shown in the drawing) which prevents the hose from unwinding in travelling, &c. On reaching a fire the ratchet is thrown back, and a sufficient quantity of hose drawn out, which is then disconnected from the remainder and attached to the engine. There is room in the engine for stowing away two or three extra lengths of hose, which, on an extraordinary occasion can be joined to the great length if required; but a reel of sufficient dimensions, to carry hose enough for ordinary purposes, can be obtained without inconveniently extending the shape, or injuring the appearance of the engine. Yours respectfully, WM. BADDELEY.

ITEMS,

The Detroit Journal says, that the acting Commissioner of the Detroit and St. Joseph Railroad advertises for 600 laborers, to whom liberal wages will be paid. They are to be employed on the part of the road between this city and Ann Arbor.

THE CONEWAGO.

It has already been stated, that the Harrisburg and Lancaster Railroad, is passable by locomotive power, the whole distance, excepting about 2½ miles. The journey between Harrisburg and Philadelphia is now made in about 10 hours, allowing of frequent stoppages, and without occasioning weariness.

There is one point on this road worth a day's ride to see; it is where the track crosses the Conewago river. In coming down, the road winds along the Conewago hills, presenting scenes of wild beauty rarely met. The track is here very far above the level of the stream, and as the land commences sloping, the earth is thrown up for the road, and when the abutments of the bridge are reached, passengers look down the wild ravine, hundreds of feet below—the long train, just resting on the verge of the fearful precipice—makes the dizzy gazer feel as if he was about to topple down the fearful height. At the bridge, tall hickory trees tower up from below, but do not approach the upward distance of the bridge; while the stream dashing and foaming over its bed of rocks, scarcely sends upwards to such a height, the noise of its course. There may be other railroads as much elevated, but we have seen none that presented so much wildness, and strongly marked scenery, as does the Harrisburg and Lancaster Railroad at that height.—[U. S. Gazette, May 30.]

From the Journal of the Franklin Institute.

IMPROVEMENT ON THE WING GUDGEON.

Sir—My attention was drawn a few days ago, to one of my water wheel (wing) Gudgeons. From some cause or other the neck of one got twisted off, and in looking to it, I thought I could make an improvement upon it. If you think it worth the trouble, and I am sure it will, you can publish it in your valuable work.—What I claim is an additional neck exactly on the opposite side of the common wing gudgeon. It can be put into the shaft without the least inconvenience, and when the outer one is worn, or broken off, it can be turned and then you have a new one. This will save a great deal of time, particularly in establishments distant from a furnace, and nineteen-twentieths of the cost as the additional neck, when made in the first instance, will not be fifty cents.

Yours, &c.

Virginia Mills, Buckingham Co., Va. EDWARD SIMS.

The following statement should teach a salutary lesson. The changes of a day are often wonderful.

REVERSE OF FORTUNE.—A subscription has been opened at Paris for the benefit of Richard Lenoir, once, it is stated, the first manufacturer in France, now an old man of 74, ill and destitute. He once possessed forty manufactories in different parts of France, and employed 10,648 workmen. "My property," he says, in his memoirs, the first volume of which has been lately published, "was, on the 22d of April, 1814, about eight millions of francs (or near £320,000.) "On the 24th I was a ruined man." The only cause of this reverse, he states to have been the sudden suppression of the duties on cotton by an ordonnance of that date made by the Count d'Artois, since Charles X., then Lieutenant General.—[London Mechanics' Mag.]

From the New-York Mechanics' Magazine.

MICROSCOPIC CHEMISTRY.

An important, but simple, arrangement of lenses, for the purpose of observing the phenomena of chemical action, has late been brought into use, which will be found, in the hands of chemists, to develope interesting facts in the process of analysis.

It will open a new and boundless field for enquiry.

Since this useful Microscope has been successfully applied a Micrometer has been added for measuring the angles of the minutest crystals.

A work has recently appeared on this subject in Paris, from M. Raspail, entitled, "*Nouvel Systeme de Chimie organique fonde sur des methodes nouvelles d'observation*," which should be in the possesion of all chemists. The observations made with this instrument may, and undoubtedly will, lead to the discovery of unknown laws of chemical arrangement between the element of fluids.—Remarkable changes are observable during the process of chrystalization; and, in the arrangement of molecules of coloring matter, the phenomena are very curious. Very curious results are also perceived on the application of the galvanic pile to chemical substances under this Microscope. The experiments which we have noticed on the arrangement of the positive and negative veins of the battery to a drop of fluid exhibited highly pleasing effects.

L. D. C.

ANCIENT COLORS.—In the *Courier* Greek newspaper, No. 65 of the date of the 7th of February, an interesting account is given of some archicological researches, recently carried on with much success at Athens. Amongst other discoveries two old paintings have been found in the Propylæa, fragments of the colors of which have been handed down to the chemist Landerer, for the purpose of investigation. As it is stated, however, that these painting are on windows it seems doubtful, though the Greek *Courier* speaks of them as ancient, whether they in reality belong to a higher antiquity than that of the middle ages, in which it is well known that the painters of the Byzantine school, mantained a high reputation all over Europe, which in our own days some German cities have made an attempt to revive. Should this be the case, no fresh information as to the composition of colors can be expected from their analysis; but if they actually belong to classic antiquity, the investigation will lead to very interesting results.—[London Mechanics' Magazine.]

PRESERVATION OF ANIMAL SUBSTANCES.—M. Gannal, o Paris, has discovered that the substances most efficacious for the preservation of bodies deprived of life are the salts of alumina; and he recommends the acetate of alumina as, of all, the best adapted for this purpose. By means of this substance, a dead body may be preserved for a length of time as effectually as if embalmed in the manner of the ancient Egyptians, and at a very trifling expense. The aluminous fluid may be introduced by the aorta, or still better, by the caroted artery, and any disication produced may be counteracted by the simple agency of a layer of varnish. It is anticipated that this discovery, from its simple and economical nature, will produce an important change in all processes to which it is capable of being applied. The preservation of specimens of natural history for museums, may be henceforth effected with a great saving of labor and cost, and the study of anatomy which could not till now be carried on in summer, and even in winter was attended with serious risk of health, may be pursued in perfect safety and at all seasons of the year.—[London Mechanics' Magazine.]

SHEFFIELD.—The entire consumption of coal in this town amounts annually to 515,000 tons, the whole of which is taken from collieries in the immediate vicinity of the town.—[Min. Jour.]

COATING WHICH PREVENTS THE FORMATION OF TUBERCULOUS EXCRESCENCES IN CASTING IRON PIPES USED AS CONDUITS FOR WATER.

The cast iron pipes which convey water to the city of Grenoble, became so obstructed by the formation of concretions of oxide of iron as to lessen the discharge of water to nearly one half in the course of seven years. This diminished diameter of the pipes appeared to remain afterwards, and for a considerable time stationary, but as no dependence could be placed upon this cessation of the cause of obstruction, it became a matter of great importance to devise the means of preventing its further progress.

M. M. Gruymard and Vicat, engineers en chef, propose an interior coating of hydraulic lime. Two years trial have satisfied them that hydraulic mortar of a suitable consistency and applied to the thickness of about $\frac{1}{10}$ of an inch is, of all easy applications,

the cheapest and best. It adheres readily to cast iron and prevents all oxidation and consequent production of tubercules.—When the pipes are long, the mortar is applied with a maulkin or swab.—[Jour. de Pharm.]

NOTE ON RADIANT HEAT.—BY H. F. TALBOT, ESQ., F. R. S.

M. Melloni says (in the Number of this Journal for December last, vol. vii. p. 475,) that

"For a long time the immediate transmission of terrestrial radiant heat by transparent substances, both solid and liquid, has been denied, and the opinion has become prevalent that we see in experiments of this kind only an affect of the heat absorbed by the body submitted to the calorific radiation."

This "prevalent opinion" he has shown to be erroneous, but by experiments which are too delicate to be repeated with facility.

As a popular illustration of the fact, therefore, seems to be wanted, I subjoin the following rude but convincing experiment.

Let a poker be heated bright red hot, and having thrown open a window, approach the poker quickly to the *outside* of a pane, and the hand to the *inside*. A strong heat is felt at the instant, which ceases as soon as the poker is withdrawn, and may be again renewed, and made to cease as quickly as before. Now, every body knows that if a piece of glass is so much warmed as to convey this impression of heat to the hand, it will retain some part of that heat for a minute or more; but in this experiment the heat vanishes in a moment. It is not, therefore, heated glass which we feel, but heat which has come through the glass, in a free or radiant state.—[L. & E. Phil. Mag. March.]

ON THE SYMMETRIZING POWER OF THE EYE.—BY THE REV J. G. MACIVAR, A. M.

Let the surface of a glass mirror be sprinkled over with some powder, as, for instance, with flower from a dredging-box. This done, on looking perpendicularly down upon the reflecting surface at the distance of distinct vision from it (unless the eye be too long-sighted,) the powder will appear, not irregularly scattered, as it really is, but symmetrically distributed in two systems of beautiful radiations, having the pupils of the eyes for their centres.

The phænomenon is sufficiently remarkable to strike even those who are not otherwise curious in such matters. It may be observed, however, that as every eye cannot catch it at once, it is better to commence by using one eye only, as this gives only one system of radiations, which, being more simple, is more easily observed. If this phænomenon has not been already attended to (and I do not recollect to have seen it noticed anywhere,) it is, I think, well worthy of investigation. Some facts are, indeed, immediately obvious respecting it. Thus, as to the region in which the physical part of the phænomenon takes place, it plainly appears that it is not either the humors or retina, as is generally supposed in reference to other phænomena of the same order, but a more deeply seated part of the apparatus of vision. For if it were any of these anterior parts, or even the retina itself, the centre of the radiant system would certainly change its place when the eye was made to wander over the mirror. In point of fact, however, that centre does not change place except when the whole head is moved, in which case it does so proportionally.

I ascribe the phænomenon to a peculiar mode of action in the nervous part of the apparatus of vision, proper to it as an elastic tissue, in virtue of which it tends, like the tissues and media experimented on by Caladni, Savar, Faraday, and others. and doubtless all elastic tissues and media, to distribute all motions impressed upon it in symmetrical systems; a view of the matter having very interesting bearings upon the principles of taste,—during the investigation of which it was that this experiment first occurred to me,—and one calculated to explain several seemingly unaccountable phænomena as to the distribution of sensibility in the retina.—[L. & E. Phil. Mag. Jour. Sci.]

Johnfield by Dundee, Oct. 14.

From the London Mechanics' Magazine.

COWELL'S WINDOW SASH SUSPENDERS.

Sir,—In your number of Saturday last, I was much pleased to find that Mr. Cowell's improvement in window sashes has been introduced to your notice.

On the announcement of his plan, I had all the windows of my residence here, as well as those of a house in the city, fitted up on his principle, and am so well satisfied, that I wish publicly to bear testimony to its utility; the expense, as you state, is a mere trifle, but the importance of the object it embraces is very great, that of saving human life.

I will only further observe, that my female servant, after shifting them once or twice, manages them with the greatest ease and facility. I mention this, because some of my friends have imagined it to be a much more formidable undertaking for a female than it really is.

I am, Sir, yours respectfully,

J. W. Cox.

9, Gibson-square, Islington, 29th March, 1837.

DYNAMOMETRIC CHECK.—A committee of the French Institute, composed of Messieurs Arago, Dulong, and Poncelet, has gone through a series of experiments on the "dynamometric (or power measuring) check," an instrument invented by Prony, and lately improved by M. de Saint Leger, mining engineer at Rouen, for the purpose of measuring with accuracy the power of steam-engines and the quantity of fuel they consume. A large party of members of the Institute and the Chamber of Deputies, of professors, engineers, &c. was present at the investigation, which took place on the 10th of March at the machine manufactory of M. Pauweis at Paris. The object of the experiments was to ascertain the practical exactness of the apparatus, and for this purpose a steam-engine of twelve-horse power of M. Pauwei's manufacture was made use of. The result appeared to be perfectly satisfactory, and the scientific world now waits, with some interest, the report of the committee of the Institute. This new invention may, perhaps, supply M. Arago with less disputable grounds for claiming for his countrymen a share in the honor of improving the steam-engine, than he has been able to supply in his two disingenerously national essays on the subject in the French *Annuaire* for 1828 and 1837.—[London Mechanics' Mag.]

From the New-York Mechanics' Magazine

GENTLEMEN —In your last number, I was much pleased with an account, and engraving of the new and much talked of Boiler of Mr Bennett. Can you inform me when the public will be made acquainted with the facts in relation to the experiment which has been so long in progress in this city? If I recollect, the boat was to have been long since completed. *Rumor* —a *famous tattler*, I am well aware, and not to be credited—has reported a failure; Is it so? Please answer this question in your next, and oblige one who is always willing to defer judgement on new inventions, until *fairly tested* by their *friends*, and not their *enemies*, and idle gossips.

A CONSTANT READER.

"A constant reader" evinces the true spirit—a spirit of kindness and liberality, which every intelligent and reasonable reader will entertain towards such men as MR. BENNET and MR. DAVENPORT. It is not to be supposed that great and important improvements in the Steam Boiler and Engine can be *perfected* by one experiment. If Mr. Bennet succeeds in his efforts, he will do infinitely more to benefit *others*, than *himself*; however great may be *his* reward, the community will derive the greatest benefit from his labors.

This argument does not, unfortunately, weigh a feather with such *patriots* as would rather have their *prophecies* of *failure* verified, than that the greatest improvements of the age should be perfected. We will endeavor to give some information in our next number, in relation to this matter.

GLASS ROAD.—Among the novelties announced for the approaching season at Tivoli, the Parisian Vauxhall, is a Glass-road, on which passengers are to travel, at a rate which would carry them over as much space in three minutes as on ordinary roads they could travel in an hour. The invention is probably a first cousin to the Russian mountains, so popular at the same gardens some years ago.

TRANSACTIONS OF THE INSTITUTION OF CIVIL ENGINEERS.

XXV. AN ELEMENTARY ILLUSTRATION OF THE PRINCIPLE OF TENSION AND THE RESISTANCE OF BODIES TO BEING TORN ASUNDER IN THE DIRECTION OF THEIR LENGTH. BY THE LATE T. TREDGOLD, M. INST. C. E.

Writers on mechanics have usually stated that the resistance which a body offers to being torn asunder in the direction of its length is proportional to the area of its section, but without showing that there are certain conditions necessary to obtain results in proportion. The object of this paper is to show in a plain and simple manner, the conditions necessary to render the resistance proportional to the area, and that there are few instances where the rule will be found true in practice.

If a weight be suspended by a small filament or thread of any species of matter, there can be no doubt that the strain at any point is equal to the weight suspended by the section at that point; and when the weight is sufficient to tear the filament as under such weight may be considered the measure of its cohesion.

Fig. 1.

Fig. 2.

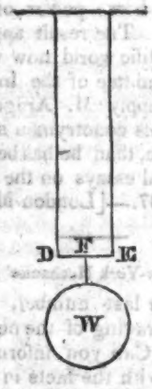


Fig. 1. Thus the weight W may be considered the measure of the cohesion of a filament at C; neglecting the weight of the portion C B of the filament for the sake of simplifying the reasoning.

Let us now suppose that two threads of exactly equal strength are applied at a given distance apart, to support a weight.

Fig. 2. Thus the weight W may be supported by two threads or filaments by means of a bar D E.

The filaments in this case being supposed to be of equal strength it is obvious that the stress on them ought to be equal, otherwise only that one which has the greatest stress on it will bear its proportion of the breaking weight.

And in order that the stress on both filaments may be equal, it is evident that the point F, from which the weight is suspended, should be exactly in the middle between the filaments. For if the point F be nearer to the filament E than to D, then E will be most strained, and consequently break before the other.

The proportion of the strain is easily found by the properties of the lever. Call the force necessary to pull one of the filaments asunder P, and we have,

$$DF : DE :: P : W \text{; whence } \frac{DE \times P}{DF} = W.$$

This is the greatest weight the two filaments will support, because when the weight pulls one apart the other will break of course. But if both filaments were equally strained the equation would be $2P = W$, and this can happen only when $DE = 2DF$, or when F bisects E D.

If the point F be only one sixth out of the centre of the bar then $\frac{6 \times P}{4} = 1\frac{1}{2} P = W$. Hence, the filament A D will be exerting only half its power when B E breaks.

Even in this stage of the inquiry we can see how important it is that the links of the chains should be formed so as to have the centre of tension in the centre between the sides of the link. But when we have to consider the extension of the material, as well as the difference of stress, the variation will be found more considerable.

The extension of a substance is nearly, if not accurately, as the strain upon it.

Fig. 3. Let a body be suspended by a pin at R, and suspend a weight by another pin at S, so that a line drawn through the supporting points may not be in the middle of the width A B; but nearer to B than A.

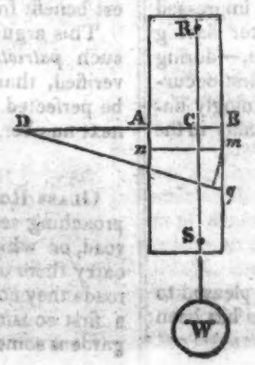
Here the solid parts below the line B A perform the same office as the lever or bar, in fig. 2, and the strain will be greater at B than at A, and the extension will also be greater, and in the same proportion as the strain; and in consequence of the lengthening of the side B, the bar will become curved.

Fig. 3.

Fig. 4.

Fig. 4. Represents the curved state of the bar. The curvature it acquires will be such that the resistance of the part A C is equal to the resistance of the part C B; and till this equilibrium of resistance takes place, the bar will continue to curve.

Fig. 5.



The distance of the neutral point may be found by different methods, but a diagram on the bar will best illustrate this point. Let B*m*. and A*n*, Fig. 5, be two equal portions of the surface of the bar in its natural state, and P*g*, A*e*, the length of the same portions where the bar is strained by the weight W. The lines drawn through A B, and *eg*, must meet in a point wherever the stress on the parts is not equal; and the point thus determined is called the neutral point.

To find the neutral point put D C, its distance from the direction of the straining force, equal z; and D B, its distance from the extended surface of the bar equal a; make $CB = y$, and $AC = x$.

Since the extension is proportional to the strain, we shall have,

$$a : \overline{z - x} :: f : \frac{f(z-x)}{a} =$$

the force of a filament at the distance x from C; its force at B being f. And suppose the section to be a rectangle of the breadth b; we have $\frac{f b (z-x) \dot{x}}{a}$ = the fluxion of the force of any filament $b \dot{x}$; and its effect is as the leverage x, therefore the fluent of $\frac{f b (z-x) x \dot{x}}{a}$ = the resistance of the part AC of the bar, or

$$\frac{f b x^2 (3z - 2x)}{6a} = \text{the resistance of A C.}$$

In like manner it will be found that the resistance of BC, is $\frac{f b y^2 (3z + 2y)}{6a}$.

Now, in order that there may be an equilibrium of resistance, we must have

$$\frac{f b y^2 (3z + 2y)}{6a} = \frac{f b x^2 (3z - 2x)}{6a},$$

or,

$$y^2 (3z + 2y) = x^2 (3z - 2x).$$

Whence we find the distance of the neutral axis,

$$z = \frac{2(x^3 + y^3)}{3(x^2 - y^2)}.$$

If d be the whole depth A B, then $x = d - y$ and,

$$z = \frac{2(d^2 - 3dy + 3y^2)}{3(d - 2y)}.$$

Consequently $a = z + y = \frac{2d^2 - 3dy}{3(d - 2y)} =$ the distance of the neutral axis from the point B.

The distance of the neutral point being found, the solution becomes easy. Thus, let f be the cohesive force of a square inch, d = the depth, b = the breadth, and a = the distance of the neutral axis from the extended side.

The force of a filament $b\,d$ will be $f\,b\,d$, at the extended side; and its force in any other part will be,

$$a : a - d :: f b d : \frac{f b (a-d) d}{a}.$$

The fluent of $\frac{f b (a-d) \dot{d}}{a}$ is,

$\frac{f\,b\,d\,(2\,a - d)}{2\,a} = W$ = the weight the bar will support.

But we found that $a = \frac{2\,d^2 - 3\,d\,y}{3\,(d - 2\,y)}$; hence substituting this value of a, we have,

$$\frac{f\,b\,d^2}{4\,d - 6\,y} = W.$$

That is, a bar strained in the direction of its length, the weight it will support is equal to the breadth multiplied by the square of the depth, and by the cohesion of a square inch in lbs.; divided by four times, the depth added to six times the distance of the direction of the straining force from the nearest side of the bar; the quotient thus obtained expresses the weight it would support in lbs.; and the dimensions are all supposed to be taken in inches.

If the distance of the direction of the straining force be half the depth, then

$$y = \tfrac{1}{2}\,d \text{ and } \frac{f\,b\,d}{4\,d - 6\,y} = f\,b\,d = W.$$

But if $y = \frac{1}{3}\,d$, then $\frac{f\,b\,d^2}{4\,d - 6\,y} = \frac{f\,b\,d}{2} = W$; which shows that by this variation of the direction of the straining force, half the strength of the bar is lost.

In the same manner the investigation may be extended to other forms, but the subject having been already treated by a different process of reasoning, and also by a different notation, in the second edition of my book on the Strength of Iron, I will not proceed further with analysis, but confine myself to a few practical conclusions.

In making a joint to resist tension, the surface in contact should be so formed as to render it certain that the direction of the tensile force may be exactly, or at least very nearly, in the centre of the bars that have to resist it.

In all the calculations of the magnitude of bars, &c., to resist tension, the greatest possible variation in the direction of the straining force should be calculated upon, and the dimensions determined accordingly.

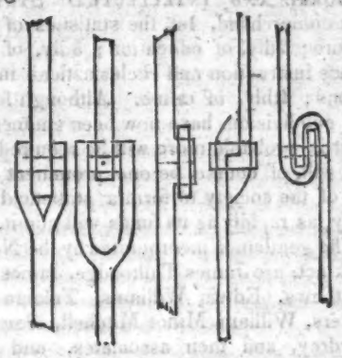
Fig. 6.

Fig. 7.

If the connections of a bar, to resist tension, be made as in fig. 6, it is very difficult to get them fitted so perfectly as to cause the direction of the tensile force to be in the centre of the bar.

A connection by a piece in the middle, as fig. 7, is more certain to effect the object of limiting the variation of the direction of the standing force, as will be obvious from the figure, and the joint should be fitted so as to bear at A the centre of the direction.

Figs. 8. 9. 10. 11. 12.



The like remarks apply to joints in long ties, joints of the forms shown in fig. 8 and 9, are very common, and very good forms for a connecting joint.

I have, however, not unfrequently seen joints in ties formed as in figs. 10, 11, 12, where the line of strain is at or beyond the side of the bar, and such a tie would obviously bend till the strain on its parts would become very unequal.

The same conclusions are obtained by considering the forces to be pressive, instead of tensile, with the exception that the strain increases the curvature when a curved bar is compressed, while it diminishes it when the bar is extended. Hence it is of still greater importance to attend to the variation from the centre of magnitude of the resisting body in cases where it is to sustain pressure.

This difficult subject, for so it has been considered by an eminent authority, whom I shall presently quote, is capable of an easy popular illustration with regard to pressure.

When a pressure is on the centre of the block which supports it, and the block is a material of equal texture, then all the parts must offer an equal resistance to the pressure, there being no reason why one part in the bounding surface of the block should take a greater or less strain, all being similarly affected.

But if the pressure be nearer to one side of the block than the other, the resistance becomes obviously unequal. If an elastic body be employed in the experiment, the inequality of compression is decidedly shown; but what body is there which has not some degree of elasticity? or what is worse, allows of compression without restoration of figure when the pressure is removed?

The consequence of a pressure being at a distance from the centre of the supporting surface does not simply depend on the distance, but also on the degree of compression it produces, for the form of the support, whether it be a column, a pillar, or a wall, will alter till there is an equal resistance on each side of the line of pressure, if it does not totally fail.

These considerations will explain many circumstances which occur in practice, where walls, piers, and arches undergo changes of form, which have always been familiar to practical men under the name of settlements.

The first person who remarked the deficiency of ordinary theories in regard to inequality of resistance was Dr. Robison, in his article on the strength of materials; he was more conversant with theory than practice, but his remarks have some interest.—Speaking of Euler's theory of columns, he says, "It leads to the greatest mistakes, and "has rendered the whole false and useless. "It would be just if the column were of ma- "terials which are incompressible. But it is "evident, from what has been said above, "that by the compression of the parts, the "real fulcrum of the lever shifts away from "the point C (fig. 5,) so much the more as "the compression is greater. In the great "compressions of loaded columns, and the "almost unmeasurable compressions of the "truss beams in the centres of bridges, and "other cases of chief importance, the fulcrum "is shifted far over towards (D,) so that very "few fibres resist the fracture by their co- "hesion; and these few have a very feeble "energy or momentum, on account of the "short arm of the lever by which they act. "This is a most important consideration in "carpentry, yet it makes no element of Eu- "ler's theory. It will now be asked (he "continues) what shall be substituted in "place of this erroneous theory? what is "the true proportion of the strength of col- "umns? We acknowledge our inability to "give a satisfactory answer. Such can be "obtained only by a previous knowledge of "the proportion between the extensions and "compressions produced by equal forces, by "the knowledge of the absolute compres- "sions producible by a given force, and by a "knowledge of the degree of that derange- "ment of parts which is termed crippling. "These circumstances are but imperfectly "known to us, and their lies before us a wide "field of experimental inquiry."

Such was Dr. Robison's view of the subject, but the question did not long remain in that state. Our celebrated countryman, Dr. Thomas Young, soon discovered the hroper mode of investigation, which was published in 1807, and yet, strange as it may peem, the popular writers on mechanics in shis country, as well as on the continent, either have not seen, or do not comprehend, the brief but elegant demonstration Dr. Young has given. We can attribute it only to the difficulty of following the inquiries of that able philosopher without a most extensive knowledge of mathematics and of nature.

From the Journal of the American Institute.

CAPTAIN CRAM'S PILE-DRIVING AND SAWING MACHINE.

It would greatly surprise our fellow citizens, if one half of the benefits which our Institute has conferred could be traced out, and presented to their view. We think they would experience a fresh gratification that their patronage and favor, which is the vital principle of its existence, has been bestowed upon it. By means of the American Institute, Capt. Cram, one of its ingenious mem-

bers was introduced and recommended to the Commissioners of the New-Orleans and Nashville Railroad, as mentioned in a former number. It was necessary for them to lay their course through swamps and low grounds in many instances heavily timbered.

The following, from the New-Orleans *Advertiser*, of January last, will show the opinion in that quarter of the benefits of invention, and the mechanical arts, in their application to this undertaking. When Capt. Cram was introduced to the commissioners, he was out of employ, and his means of support for himself and family almost exhausted. He has since become independent, and he has benefited his employers hundreds of thousands, if not millions of dollars. We have frequently heard him spoken of as having produced a new era in southern internal improvement.

Below is the extract from the publication referred to.

"We are indebted to James W. Breedlove, Esq., for the very interesting and descriptive letter that follows, obligingly copied by him for our use, as he states it to have come into his hands by accident. As we have ever been willing to make our columns subservient to the promotion of works tending to benefit and develope the resources of our country, by laying before the public our own views and opinions, or giving publicity to the apt suggestions of others conversant with the subjects which they undertook to explain or discuss, we cannot now hesitate in laying before our readers the clear and lucid views taken by this writer; feeling satisfied that any thing having a bearing on a matter of such vital importance as the New-Orleans and Nashville Railroad, will be perused by them with avidity, and weighed with proper deliberation."

New-York Statistical Society.—A statistical society has been recently incorporated by the Legislature of the State for the city of New-York. Its capital stock is fifty thousand dollars, in shares of two hundred and fifty dollars each; the society to commence operations when the whole sum shall have been subscribed and five thousand dollars paid in. It may hold real estate convenient for the transaction of its business, provided the income does not exceed five thousand dollars.

The society is modelled upon the plan of that of London, incorporated in 1834.

All opinions are excluded—facts only being its object, and as far as possible, those that can be arranged in a numerical and tabular form. The subject was divided by the British Association at Cambridge, into 1. Economical—2. Political—3. Medical—and 4. Moral and Intellectual Statistics. The class of

Economical Statistics comprehends, 1st the statistics of the natural productions and the agriculture of nations; 2ndly, of manufactures; 3dly, of commerce and currency; 4thly, of the distribution of wealth, or all facts relating to rent, wages, profits, etc.

Political Statistics furnish three subdivisions, 1st, the facts relating to the elements of political institutions, the number of electors, jurors, etc.; 2dly, legal statistics; 3dly, the statistics of finance and of national expenditure, and of civil and military establishments.

Medical Statistics, strictly so called, will require at least two subdivisions, and the great subject of population, although it might be classed elsewhere, yet touches medical statistics on so many points, that it would be placed most conveniently, perhaps in this division, and would constitute a third subdivision.

Moral and Intellectual Statistics comprehend, 1st, the statistics of literature; 2dly, of education; 3dly, of religious instruction and ecclesiastical institutions; 4thly, of crime. Although fourteen subdivisions have now been enumerated, it is probable more will be required.

It will, of course, be one prominent object of the society to form a statistical library, as rapidly as its funds will admit.

The gentlemen incorporated by the New-York act, are James Tallmadge, James M. Matthews, Edwin Williams, Talman J. Waters, William Minot Mitchell, Samuel Cowdrey, and their associates, and the board of trust, for the present season, is composed of the same gentlemen, with the addition of Livingston Livingston, George Bacon, Benjamin D. Silliman, John W. Francis, Timothy Dewey, Reuben Ellis, and Jonathan Amory, with power to perpetuate the succession.

The subject of statistical societies for the United States, was recommended in this Journal, Vol. xxxi. p. 186, by Mr. Sanderson, as the representative of the Statistical Society of Paris, with which we have interchanged publications and correspondence ever since its institution. Although from the pressure of other duties we have been obliged to decline taking an active part in this subject, we are much gratified to find that it has been brought forward under the best auspices. The subject is one of extreme importance to the United States, in every view that can be taken of it—political, social, moral, economical, commercial: accurate facts, digested and arranged, so that the proper deductions shall of course flow from them, are no where so much needed as in the United States, because we are still in the forming stage of society—because our interests are immensely diversified, and because in this republic, beyond any nation that exists, or that ever did exist—man, in high intelligence, is in a state of the greatest activity, with the most numerous and powerful excitements and with the feeblest restraints. Political economy must be founded wholly upon statistics, and there is no way to obtain correct results but by a patient collection of facts.

Our abled statistical writers, Seybert and Pitkin, would have derived immense advantages from the labors of such a society, and we hope to see its operations and influence become co-extensive with the nation. It is obvious that the subject admits, on this occasion, of cogent and ample illustration, from which we are precluded by the want of time and space.

Valuable Invention.—It is remarkable that an invention far more valuable to all who travel upon the seas, lakes, and rivers of this great commercial country, and more important, on the score of humanity, than any other devised by human ingenuity, should remain in comparative oblivion and neglect. We allude to that beautiful preparation of *pulverized cork*, for seamen's and passengers' mattrasses and beds. Will it be believed that a mattrass made of this material, weighing only twenty-five pounds cannot be sunk by the weight of seven men? and that one or two persons might float on it in the midst of the ocean, with as great security from drowning, as if he were on board a ship? Yet such is a fact, as demonstrated by experiment. The beds, cushions, &c., made of this preparation of cork, are more elastic, soft and comfortable than those of the best hair, and have the superior advantage of never becoming matted. Every ship and steamboat should immediately substitute them for all others, and even passengers going to sea should purchase one.—[New Era.]

Animal Electricity; by MM. Linari and Matteucci.—The five helices employed by M. Linari, contained five hundred and seventy-seven metres of copper wire. Two had the ordinary form; the three remaining were composed of the wire wound spirally in a plane, and had a square perimeter. Through one of these helices was passed a cylinder of iron, 0m 635 long, and 0m 31 in diameter. This system of helices was connected and terminated by two plates of silver, provided each with an insolating handle. The circuit was interrupted by cutting the wire between the last belix and one of the plates of silver, in order to insert the extremities of the wire into a vessel of mercury and thus amalgamate them.

The experiment was performed as follows: the torpedo wiped dry, was placed on a plate of glass, with one of the pieces of silver upon his back and the other on his belly. The animal was then irritated by striking him with one of the plates on his tail and gills, and was thus induced to discharge himself. After several trials, M. Linari succeeded in obtaining a spark, which appeared between the mercury and the wire. By touching together the amalgamated wires out of the mercury, he succeeded in obtaining a succession of brilliant sparks. He observed no difference in the capabilities of torpedoes of different sizes to produce this result. A small one four inches in diameter afforded a long succession of bright sparks.

The decomposition of acidulated water, and a durable magnetization of a steel needle were invariably obtained by M. Linari.

M. Mateucci employed in his experiments similar apparatus to that of Linari, containing however only three hundred metres of wire, of which he made two double helices. One of these helices was 0m 44 in length, and had a diameter of 0m 05m; the other was 0m 72 metres in length, and 0m 03 in diameter, and was wound on a horse shoe. In the interior of the two helices was placed a cylindrical bar of soft

iron. With this arrangement, completed as above described, Matteucci succeeded without fail in obtaining a bright spark. One of the helices wound on a horse shoe sufficed to produce the same successful result.

Matteucci attempted to obtain the electric spark by means of two plates of brass, with short wires attached and inserted into mercury. But, notwithstanding the employment of every means which could insure success, he failed in obtaining any effect except the shock. He therefore infers since the spark is not obtained with a very short wire, and on the contrary is easily obtained with the above described helices, that the spark is produced where the discharge ceases, in which case the current, *by induction*, adds to the primitive current.

He has also ascertained, by means of a delicate galvanometer, that the current passes from the back to the venter, and that the back may be considered the positive pole and the venter the negative.—The discharge is effected in the same manner by the two organs situated on the sides of the torpedo, and the current is produced in the same directions when one of the needles of the galvanometer touches the ventral part of the left organ and back part of the right, or inversely. The deviation in the galvanometer is augmented if the two needles of platinum are put in contact with two metallic plates placed on the two sides of the fish, instead of a direct application of the needles. A discharge can almost invariably be produced by forcibly curving the torpedo, making the venter the interior of the curve. A removal of the skin of the animal diminishes the deviation, but does not entirely prevent it. If the outer of the three nervous cords which proceed from the brain to the electric organs are cut, the electric discharge may still continue. It ceases immediately on cutting the intermediate one.

These experiments were tried with thirty-six individuals, which M. Matteucci obtained during a long residence at Cesenatico.—[L'Institut, No. 167. July, 1836.]

Compliment to American Genius.—Our mechanic Avery's simplified steam engine, exhibited in full and successful operation at the last New-York Fair, and since admirably applied to various mills in the interior is highly extolled by the learned Dr. Lardner, and is to be reported upon at the French Institute, by the illustrious astronomer Arago. What will they say of the total abandonment of fuel and steam in Davenport's Electro-magnectic Rotary machine ?—[N. Y. Star.]

Facts *for consideration*, and they should cause serious reflection.—[Eds. Mechanics' Mag. Railroad Journal, and N. Y. Farmer.]

Eight years ago we had a United States Bank of $35,000,000 capital, *twenty million of specie* in the country, and a currency equal to any in the world.

The United States Bank has been vetoed, the deposites removed into the "pet banks," and now, with *eighty millions of specie* in the country, we have either no currency at all, or *one of the very worst in the world!*

Eight years ago a man could travel through the United States and Canada with bills of the United States Bank, and without having to pay *one* per cent discount.

Now, the pet and other bank bills are from *five* to *ten* per cent. discount, even in the States to which they belong.

Eight years ago, with twenty million of specie in the country, they were at par, and all the banks paid for their notes in specie. Now, none of the banks pay it, and *one hundred and ten dollars* of the best bank paper must be given for one hundred dollars in specie.

Eight years ago we had specie for change; now we have thousands of tickets called "*shin plasters*," or no change at all.

Eight years ago, business, commerce, and trade all went on smoothly and prosperously. Now, business is broken up, trade destroyed, and bankruptcy, distress, and poverty, staring people in the face.

Eight years ago, the expenses of Government were thirteen millions of dollars. Now, they are over thirty-two millions of dollars.

Agriculture, &c.

Rose Bugs.—The best antidote against the rose bug, and the small yellow bug, that has yet come under my inspection, is *slacked lime* applied with a dredging box, while the fruits or plants are wet with dew. If the fruits or plants be wet with a weak solution of gum arabic previously to the application of lime, it will remain on them much longer, and no injury will be sustained by it. If applied to young cucumber plants, the seed leaves must be carefully turned up, wet, and the lime applied as aforesaid. The lime used has been nicely slacked with a little water, one year, for the purposes of the garden. Perhaps it would be equally as well if slacked immediately before its application.

It was found that if rose bugs while on plants be thoroughly wet with very strong soap suds, (one gill of strong soap to one quart of water) they soon die. This strength did not injure the plants on which it was tried. This experiment was made when the bugs were on the decline, and whether the mixture would have the same effect in the beginning of their race, while in their utmost vigor, or prevent from preying on the plants wet with it, further experiments may determine. It is needless to say any thing in this paper, as to the fertilizing power of this application or that of lime.—[Dr. R. Green, Man-field, Mass.]

Engrafting Grape Vines.—A friend of the editor says that he has succeeded in grafting foreign grapes on native stocks, and thinks that notices on that subject may be useful. In the N. E. Farmer, vol. vii. p. 329, are some directio s relative to this improvement, which were, originally, communicated to John Prince, Esq. by Brig Gen. Armistead, from which the following are extracted:

"I picked out four *native* vines, [in the month of March] and headed them down as low as the turf, and after going through the common process of inserting the graft, I bound them with woolen yarn, and covered them with common grafting clay, and to make the process doubly sure, I cut large sods and enclosed the grafts completely, and covered them in this way about four inches, leaving two eyes exposed. The experiment proved the utility of thus preserving them from sun and air, for three out of four took, and on the head of the largest vine, I put two grafts, both of which survived, which made it equal as if all had taken. The result of the first year was, that the grafts averaged a growth of from nine to twelve feet. The second year they bore many bunches of graper. The third year my mother wrote me that they had gathered upwards of two barrels from my four vines. The succeeding year the neighborhood was in part supplied, and from others following the example, no failure of fine fruit has, I believe, existed in that neighborhood."

We believe it is not yet too late to graft grape vines, and wild stocks to engraft on may be found in woods, &c., in many parts of the country.

From the New-York Farmer.

We commend to our readers the following communication. It is from the pen of a practical farmer of great experience—from one who has long practiced what he recommends, and profited thereby—we ask for it not only an attentive perusal by our patrons, but also an extensive *re*-publication by those Editors with whom we *exchange*. Of the writer we ask frequent communications of the same kind.

Messrs. Minor & Schaeffer—During a long life I have never witnessed a period wherein the necessity of agricultural improvement was so imperious as at present. In an extensive fertile country it is wonderful to behold the inhabitants importing their bread stuffs and other forage—and for no other reason but for lack of industrious and skillful cultivation—thus we see a little Seagirt Island three thousand miles distant supplying the people of a fertile continent with those productions which our farmers ought to produce to supply them. This demonstrates what may be done by the powerful machinery of industry, knowledge, and skill, united. On viewing our present condition, I feel a blush of shame for myself, and my country—every acre of our soil, with no more labor, might produce double its present yield if all was done perfectly right. I say unto you my brother farmers we must do better. Listen for a moment to the voice of more than sixty years experience. Many good periodical works on agriculture are now extant—buy some one of them,—plain common sense will direct us to those articles that apply to our

business. The New-York Farmer is a work I have prefered—it contains generally much useful information for us. Industry must lead the way, for this will produce knowledge, and knowledge will produce skill—and these three sublime atributes if kept in exercise would soon renovate the condition of our country, and this not only ought—but must be done—or otherwise hunger and shame will await us. I have only time at present for one general remark. Infinitely more may be done by contracting your cultivated acres and tilling them higher and to greater perfection. The time in arable and in grass culture should be short, say two years, or never exceed three; use plenty of grass seed,—white clover is one of the best. If a life already protracted and health shall be sustained, I shall be happy to confer with you again.

THE OLD MAN.

AGRICULTURE.

One effect which it is supposed the present state of times will have, may be looked upon as decidedly advantageous, and that is now in the greater attention which it is probable will be given to agricultural pursuits. The fertile, uncultivated lands, with which portions of our country abound, have been too much overlooked, and we presume will be more carefully looked after. The life of a farmer has more attractions, by far, and more solid, substantial comforts than the multitude seem willing to concede. Too many have, of late years, left its quiet and healthful pursuits, to crowd into the already over crowded cities; forsaking with most perverted tastes, the green fields and fine atmosphere of the country, for the dust and noise, and confined air, that is found in streets and alleys. We think attention will be now strongly turned to the cultivation of the soil, by thousands whom the embarrassments of the times have deprived of employment and as a consequence, provisions of every kind, will be more abundant and cheaper. It is time the current should set the other way, and if the distress under which the whole country now suffers, has the tendency to divert labor into its more appropriate channels, we may find that even this affliction has not been without its advantage.—[U. S. Gazette.]

THE CROPS.—The coming season bids fair to be one of the most productive ever known. The agriculturists have been taught a useful lesson, by the experience of the past year, and there probably was never so much ground put under cultivation in the United States, at any one time, as there has been this spring. Our exchange papers from every quarter, brings us cheering accounts of the state of the crops, and all anticipate a rich harvest.—This is really good news. The past year has been one of dire disaster in almost every respect, and the scarcity and high price of provisions, has intensely aggravated the other evils; but a couple of fruitful years will go far towards repairing all our losses.—[Buffalo Com. Adv.]

We are pleased to learn from almost every part of the country, that the wheat fields are in a very flourishing condition and bid fair to yield a good crop.—[Minors Journal, Pottsville, Pa.]

NEW METHOD OF PROPAGATING APPLE TREES.—A new plan for increasing plantations of apple trees, has lately been carried into extensive practice by the horticulturits of Bohemia. Neither seeds nor grafting are required. The process is to take shoots from the choicest sorts, insert them in a potato, and plunge both into the ground, leaving but an inch or two of the shoot above the surface. The potato nourishes the shoot, while it pushes out roots, and the shoot gradually grows up and becomes a beautiful tree, bearing the best fruit without requiring to be grafted.

Whatever may be the success of the undertaking, its novelty is at least an inducement to give it a fair trial.

From the New-York Farmer.

ANIMAL MANURE,—NIGHT SOIL, &c.

NEW-YORK, May 12th, 1837.

Gentlemen—Agriculture is the source of the wealth of nations; the most enlightened governments have always given it encouragement, knowing that the earth pays generously a man's labor; therefore one is right to ask how it is that your country, which is productive enough to subsist, not only the American continent, but Europe also, is under the necessity of importing every year, so many thousand bushels of grain? This is a state of things by no means creditable to the country—but the surprise is still greater when you come to consider the high price of the first necessaries of life; especially of vegetables in your markets. The population of Paris and London are much larger than that of New-York, and yet the markets are more abundantly supplied with all those kinds of provisions, and at a much lower price. Is it the cause in the high price of, or rent paid for, land in the vicinity of New-York? or is it in the carelessness of cultivation, want of management, or ignorance of the use of *cheap* and *powerful* manure? The larger the city, the more abundant is the manure produced, *if it is well managed*—and properly attended to.

Allow me, Gentlemen to ask you what becomes of the cleaning of streets, and of the night soil?

In what state is the first article given to the farmer, and at what rate?

How do they manage in your city for the *second* article so much sought for in French, English, German, and Chinese husbandry?

What kind of animal manure do they make use of here, beside the bone manure, so costly after all?

Do they employ, or understand the value of, the manure known by the name of *Poudrette*, which is considered by all cultivators in Europe and China, as the most powerful manure used, when well prepared, by a *disinfecting* process, which *removes* the offensive effluvia of its unprepared state?

If any of your readers will furnish you with a statement in relation to its use and management in this country, for my benefit, I shall take pleasure in furnishing you with some interesting facts in relation to its use in France and Germany, for the benefit of agriculturists in the vicinity of New-York, and other large cities of the United States.

I am sir, very respectfully,

B.

The subject of *Animal Manure* has attracted considerable attention of late. We some time since received the preceding communication from a scientific foreigner, which induced us to make enquiry on one of the important subjects to which he alludes, and in reply we have received from a valued correspondent, the following important communication. It contains useful information to many of our readers; and will be the means, we hope, of inducing our correspondent B. to resume the subject in a way which may add another to our present means of improving the soil—a pursuit, in these trying times, to which *thousands* are resorting, who have heretofore viewed it as degrading. *Degrading! Agriculture* degrading? Who *is*, if the skilful cultivator of the soil is *not*, NATURES NOBLEMAN? And he, who discovers a *new* or applies successfully any previously discovered, but *unapplied*, process of improving the soil, so as to cause "two blades of grass to grow where one only grew before," is entitled to more gratitude and consideration, from his countrymen, and the world at large, than the successful conqueror of an hundred battles—who conquers to oppress.

The pursuit of agriculture is becoming more justly appreciated—and this feeling will gain ground precisely in proportion to the introduction of improved modes of cultivation—it therefore becomes the imperative duty of every friend to the cause to give it the aid of his experience and observation.

We hope soon to be able to publish many interesting facts on the subject.

Boston, May, 1837.

D. K. Minor,

Dear Sir,—In answer to the inquiries in your late letter, I am happy to give you the best information which I can obtain.

"Night soil" is deemed one of the most powerful manures that can be used; and my own experience in its use, which has been considerable, confirms this opinion. It is much used in China, where it is mixed with marl; in this way freed from its offensive odor, and made an article of common traffic and distant transportation. By what process this is done I have no information. In Holland it is thrown into their large urine cisterns, where the urine of their cattle is preserved; and these mixed with rape cake (after the oil has been expressed) and other refuse substances, and carried out in the spring in a liquid state into the fields. In Paris it is dried in some way, and converted into a powder; and this powder, or "poudrette" as it is called, is very extensively used in the vegetable gardens round the city. In the neighborhood of London it is dried, in some way, and packed and transported as a powder. In this vicinity it has been extensively used; and is obtained and transported in a crude state in large covered and water-tight wagons. The city has a superintendent of privies. The citizens, who wish their vaults cleansed apply to him. He contracts with certain individuals at a certain rate per cubic foot. The city likewise contract with certain farmers to be ready with a wagon to receive the contents. The owner pays for the emptying; and I believe the farmer is either paid for the transportation, or has the manure delivered into his wagon free from all expense. The carts are not allowed to enter the city until after ten o'clock in the evening; and obliged to leave it before sunrise. The farmers pay their men something extra for this night labor, over their usual wages. The farmers deposite it in a shallow hole dug in the ground, and mix enough loam with it to absorb all the urine, and make it easy for them to handle it in the spring.

The farmers deem it excellent for grass grounds spread broadcast; and excellent for all vegetables, excepting potatoes, and particularly for vines, squashes, cucumbers, melons, &c., and especially for corn. The objection to its use for potatoes is, that it causes them to run too much to top; whether this is well founded or not I do not know. It has been said by some persons that its effects are very transient, but, as well as I can learn, this opinion is *without foundation*, and its efficacy is as durable as of any manure. Many persons advise to the free intermixture of quick lime with it. This will destroy its offensive qualities; but there is no doubt that, while it destroys the offensive odor, it *also* destroys its efficiency. This I believe is the effect of the intermixture of quick lime with any animal manures. In the country, where it was easy to get access to the back of the privy, I had a moveable shutter, and a large pile of loam always placed near, and during the season when frost and snow did not prevent, was accustomed to throw frequently among the manure enough of the loam to render the deposite inoffensive and absorb all the liquids. By this method I found no difficulty, whenever it was necessary, in removing the contents.

The facility of obtaining this manure in New-York must be immense. Its transportation by water, provided it can be removed in a desiccated state, to the shores of Long-Island, cannot be difficult; and indeed up the Hudson; but I do not know what plan to recommend, to put it into a portable state. I should be very glad to be informed; and you may command any farther information which I can give you.

Respectfully yours, H. Colman.

The Season and Crops.—For about three weeks, the weather has been cold and wet. On Tuesday week there was frost, and on Monday the 29th inst. another severe one. The blossoms of the apple began to appear a week since, but have made but little progress since. Our gardens are very backward, and spring grain is not sufficiently advanced to warrant an opinion as to its promise. Wheat has improved very much since the rains set in, and there is now a fair prospect of full three fourths of a crop—at least in this vicinity. So far as we may judge by the newspaper accounts, this part of the State is as well advanced as any other. The season below the Highlands has not started vegetation much if any before ours, and the ice in Lake Erie has retarded it at the west considerably behind the usual period.—[Onondaga Standard, May 31.]

From the Journal of the American Institute.

HINTS ON THE CULTIVATION OF THE MULBERRY, WITH SOME GENERAL OBSERVATIONS ON THE PRODUCTION OF SILK, BY LEWIS TINELLI, DOCTOR OF CIVIL LAW IN THE UNIVERSITY OF PAVIA, AND FORMERLY PROPRIETOR AND DIRECTOR OF A FILATURE OF SILK N LOMBARDY.

Mr. Tinelli adverts to the peculiar situation of the northern States, and the necessity of their providing a staple of export.—We advert to his remarks, not because they are new, but as the impartial suggestions of an intelligent foreigner, who has made America his country, and who looks upon our condition as it actually is.

"When," says he, "we look at the table of imports and exports of different merchandise in the ports of the United States, we are struck with the lamentable fact, that the northern States, with a widely extended and very fertile territory, are not only without any considerable staple of export, but even do not always produce enough for their own consumption.

"The example of the year just passed, is a proof of this assertion. Where, then, are the elements of prosperity for these States, and the foundation of their commercial wealth? Can they consist in the profits of that foreign commerce which is carried on at our various marts with all parts of the world, or in the present productions of the soil? Certainly not. The resources of foreign commerce are too subject to variation, to secure the permanent riches of a nation spread over so vast a surface, and possessing so immense a territory for cultivation. * * *

"Looking at the actual state of things, the real relations existing between the north and the south, and casting our views forward into the future, it might be allowable to doubt, whether the productions of the southern States will always serve to employ profitably the extended speculations of the north; and whether the northern States will not be obliged to seek in their own resources of agriculture, a supplement at least to the commerce in cotton, rice, and tobacco."

On the uses of the mulberry, we quote as follows:

"All the different parts of the mulberry are useful, and good for some purpose or rather. Its leaves form the only food that experience has found appropriate to nourish the silk worm (phalana bombyx of Linnæus.) The leaves of a second growth serve, at the close of autumn, as an excellent nourishment for cattle and sheep; it being understood, however, that the second gathering ought not to be made till the vegetation of the plant has entirely ceased, and the sap has began to descend from the branches. The body, and larger limbs, not only make excellent firewood, but may also be converted into boards, of a beautiful, yellowish color, and finely clouded, for the use of the cabinet maker; the fibrous epidermis of the young branches, that are often cut, either for the purpose of engrafting, or of pruning, and directing the shape of the tree, if macerated in lime and water, may be made into paper, that is extremely delicate and shining, and is properly called silk paper. The young mulberry trees take the most beautiful forms that it may please the hand of man to give them; and thus this plant, so rich in its produce, furnishes also an elegant ornament in parks, or gardens, and in the avenues to villas and country houses."

Frequent attempts have been made to find a substitute for the mulberry, as food for the silk worms, but the experiments have failed; many other plants have nourished them for a few days, after which it has caused their death, or affected them with distempers.

"Experience has not only shown that the silk worm has no other aliment proper to its nature than the mulberry leaf, but it is also ascertained to be extremely hurtful to this delicate insect to change the quality of the leaf, as inexperienced persons, in rearing them, are too apt to do. The cocoons produced by worms uniformly fed with the same kind of leaf, are always more beautiful, finer, richer in silk, and of a more delicate tissue."

With regard to the constituent elements, we extract:

"It is not doubtful, in my opinion, that silk is only an extract from the substances which nourish the insect that spins them, and upon the quality of the aliment depends the quality of the silk.—

This opinion seems to me to be supported by the observations on species of mulberry recently discovered by Professor Rafrau Delillo, of Montpelier, in France, which he calls *morus nervosa*. It is said, in fact, that the transparent edges are formed by the extravasated gummy and resinous matter of which the silk is constituted, and that the worm that is fed with this sort of leaf gives a silk of finer quality and greater quantity. It has always been seen that an immense service could be rendered to the seropedic art, if we could ascertain, by an exact and thorough analysis, what is the actual composition of silk. Unhappily, this precise knowledge is yet wanting. Berthollet, Fourcroy, and Chaptal, have declared that silk has much analogy with the tissue of horn, and that by distillation, they have obtained from it carbonate of ammonia, and a large portion of oil. Roard, in his excellent Memoir, addressed to the National Institute at Paris, (see volume xxix. Decreusage des Soies,) on this subject, gives an analysis conformable to the observations of the three chemists above named. He demonstrates that the yellow silk contains:

"A. Of gum, 24 or 25 per cent.

"B. Of coloring matter, which is a resinous substance, nearly solid at 12 degrees of the centigrade thermometer, and entirely liquid at 30 degrees, its proportion is 55 to 60 per cent.

"C. Wax, which melts at between 75 and 80 degrees, is insoluble in water, and dissolves easily in the alkalies, or in soap.

"It appears the wax forms the exterior varnish of the silk; it is found in the yellow as well as the white, and forms 1-200 or 1-250 of their weight.

"D. A volatile oil, having a strong and disagreeable odor.—By itself, it resembles the essential oil of anise, or of any other vegetable matter. Brigman has also stated that silk is of an intermediate nature, between vegetable and animal, which corresponds with the qualities discovered by the other chemists."

As to the climate and soil best adapted to the mulberry, Mr. T. remarks as follows:

"Hills, are beyond doubt, the best situation for this tree. They are, so to speak, so many large *espaliers*, where the greatest brightness of the sun's rays is united with the influence of fresh air. Mulberries so situated give, if not the greatest quantity, certainly the best quality of leaves; above all, when the soil is moderately light, and tolerably moistened by exhalations from a neighboring lake or river. The small stones that are commonly mingled with the soil in such situations, are very useful in keeping the ground loose, and thus facilitating the growth of the roots, while reflecting the rays of the sun. They contribute to secure that degree of warmth which is essential to the formation of the sap in all young trees.

"The action and influence of the air easily penetrate into these light soils, spreading and developing the more fully the delicate principles of vegetation. Strong and clayey soils are much less fit for the mulberry. The strata of clay, by their hardness, obstruct the percolation of the rain drops, and cause an excessive wetness, occasionally very hurtful to the roots of this tree. Nevertheless, we may sometimes see superb plantations of the mulberry, in a luxuriant state of vegetation upon the great plains composed of alluvial land, or of the tertiary formation.

"It is certain, that in plains the growth of the mulberry is more rapid, and its leaves will be more abundant; but the worms nourished with such leaves, will give a silk that is less strong, coarser, and less in quantity. An exposure to the south, or to the east, is generally the best. The north and north-east winds are injurious to these trees; but the vicinity of lakes and rivers, is always a certain element of prosperity for mulberry plantations."

It seems to be admitted, that the various species of mulberry, if propagated by seed, do not give precisely the same kind of tree; engrafting is, therefore, resorted to by skilful culturists. Scarcely fifteen or twenty per cent. of the *morus multicaulis* seed preserve their characteristics.

The multiplication of the mulberry, by cuttings and by seed, we give at length:

"All species of mulberry may be multiplied by means of cuttings—taking the most vigorous shoots of one year's growth, cut in pieces of five or six inches in length. These cuttings are planted in a nursery-ground, which is well dug, and dressed with well prepared manure, at the distance of two feet from each other. The ground ought to be watered for fifteen or twenty days after the planting, and every possible care should be taken to guard the young plants from the heat of the sun, by means of straw or boards, with which a temporary covering should be made. It is also very necessary to give attention that the cuttings are taken from the trees when the sap is already in circulation, and vegetation is in full vigor. This method of multiplying the tree is, however, only followed in the smaller agricultural establishments.

"Besides that at least one half of the cuttings, which are planted in a nursery-ground, do not take root, and, in a few days become quite dried up and dead—it is a fact, that cuttings furnish always very feeble trees, that do not last long, even in soils that are humid, or often watered, where they prosper best. But the morus multicaulis, which abounds more in moisture, and has a softer wood, is more easily multiplied by cuttings. This is, indeed, the only means of propagating them, without changing their species. The trials made heretofore of this tree, are not of sufficient duration to ascertain whether the plants formed with cuttings will attain the same size. The seed of the mulberry ought to be taken from those trees that are in perfect health, neither too young nor too old, and let care be taken not to strip the tree of its leaves the same year. It is also a good plan to mix the seeds with fine sand, a little moist, about two hours before planting them.

"The ground in which they are sowed, should be of a light and sandy soil; and to be as much as possible permeable to the young roots; to the atmospheric gases; to rain and to warmth; it should be dug to the depth of eighteen inches. After the seeds are buried in the earth, it is necessary to press and beat the surface lightly. If the ground is rather dry, it ought to be watered frequently; but, above all, it is requisite often, and with the greatest care and gentleness, to stir up the earth, clearing it from all parasite plants, which would impede the growth of the young trees. This work requires considerable patience and can be best done by a careful and industrious woman. The best manure is ashes and sheep-dung, well dissolved.

"If the nursery-ground has been well attended to, during the first year, the little mulberry trees may be taken up, in order to be replanted, either in another nursery, in order to become large trees, or in the field, to make hedges of low stature. But if it is preferred to leave them longer than the spring, in order that they may gain greater strength, it is useful to cut these stems close off to the ground. The new growth will acquire additional vigor from this operation, and there will be obtained, the second year, a mulberry tree four or five feet high, and sometimes even more.

"I tried, about ten years since, the effect of sowing in one of my fields that was well cultivated, and of a good soil, the mulberry seed separately, one by one, in the very places where I desired to have a hedge-row, and also trees of full size. I took great care to keep the ground free from all sort of grass near the young trees as they sprung up, and to have the soil loosened often. The result surpassed my hopes. At the end of three years, my hedge was five feet high, and very rich in branches and leaves. Those of the plants that I desired to become large trees, commenced in the fifth year to afford me leaves, and they had already attained to a noble height. * * *

"The best manure is dung not too much decomposed, for these plantations; but care must be taken, that the dung does not come into actual contact with the roots, which should be entirely surrounded with good mould. Small pieces of wood or straw, the sweepings of a woollen factory, or woollen rags, and all such like materials, are excellent manure for all plantations of the mulberry. But *sheep* dung is the best of all, especially for cold lands. * * *

(To be continued.)

From the Genesee Farmer.

STOCK IN THE WINTER.—What is the expense of keeping stock through the Winter? is a question frequently asked, and the correct solution of which is of consequence to the farmer. I have paid some attention to the subject, and am willing to allow my opinion to be laid before your readers. My hay has been cut and secured in such a manner that its quantity could be estimated with tolerable accuracy, and the manner of its distribution rather more than guessed at. My horses have eat rather more than 2 tons

each; oxen will eat about the same; cows a ton and a half; sheep require a ton to eight, or twelve ton to a hundred; and calves will make way with about half a ton each. This I am aware is more than has been usually allowed, but I am confident it will be found rather under than over the quantity required where hay alone is used, and it is desired to bring the stock through in good order. Farmers by the use of other fodder, such as corn-stalks, straw, &c., greatly reduce the quantity of hay fed, and where the materials are cut, a still further saving is effected. If horses are worked constantly during the winter, they must have at least thirty dollars worth of oats to a span, in addition to the hay. I am convinced that horses pay the least profit of any animal whatever in proportion to the cost of raising, and should be pleased to see sheep and cattle taking the place of those droves of straggling worthless colts that swarm on many farms. First rate horses will always command a good price; as the means of keeping at present are, ordinary horses are worse than nothing. Animals with us must be fed from the first of November to the middle of April or later, and those which are the most valuable in every respect should alone be selected by the farmer, as the subject of such expense. Let every one count the cost of his different animals, and determine for himself.

Advertisements.

TO RAILROAD OR MANUFACTURING COMPANIES.

We ask attention to the following advertisement. The gentleman referred to will be found an acquisition to any company that requires the aid of a superintendant, professing skill, experience and character—and we shall take great pleasure in being the medium of communication to him from those who may desire information.—[Eds. R. R. Jour. and M. Mag.]

☞ TO RAILROAD COMPANIES.

A PERSON experienced in the construction of Locomotive Engines (many of his Manufacture being in successful operation on important Railroads in the United States) and who is likewise thoroughly acquainted with the management of such machines, and, indeed, the entire ordeal of Railroads, is desirous of obtaining the situation of General Superintendant on some Rail road, South or West.

The most satisfactory testimonials of character and capability can be produced. Communications addressed to the Editors of this Journal, stating the location of Road, &c. will meet with prompt attention.

9t—24

ENGINEER'S OFFICE, WILMINGTON AND RALEIGH RAILROAD, May, 4, 1837.

TO BRIDGE BUILDERS—Proposals will be received until the 30th June, for the erection of Bridges on the Wilmington and Raleigh Railroad, across the Neuse and Tar Rivers, Contentnea, Swift's, Fishing and Quanky Creeks. The Bridges will be built on the plan of Town. The greatest span will not exceed 120 feet, the frames weatherboarded and capped (not roofed.) The timber will be found.

For the piers and abutments, stone can be had, at the Neuse six miles by water from the bridge site—at Tar River it is found at the crossing—at Contentnea, the Bridge will rest on wooden abutments; at Swift's Creek, the rock is situated about 3 miles by water from the bridge site—at Fishing Creek it is found within a few hundred yards of the bridge on the bank of the creek—and at Quanky the quarries are situated about three miles by land from the proposed bridge. The piers and abutments will in no instance exceed 22 feet in height. For further particulars, address the subscriber at Wilmington, North Carolina.

WALTER GWYNN, Civil Engineer.

2t—24

MECHANICS' FAIR.

Notice to Mechanics, Artisans, Manufacturers, &c.—The undersigned give notice that the first Annual FAIR of the Massachusetts Charitable Mechanics' Association will be held in the city of Boston, in September next, commencing on Monday, the 18th, and continuing at least three days.

The Association have placed at the disposal of the Board of Managers, the sum of Five Thousand Dollars, to enable them to conduct the Fair upon a liberal scale; and they hope to be able to render satisfaction to all who may feel disposed to offer articles for exhibition.

Medals or Diplomas will be awarded to the owners of all articles that may be deemed worthy of such distinction; and the Managers intend that the strictest impartiality and fairness shall be observed in the distribution of Premiums.

The Managers, in furtherance of the subject they have in view, invite contributions, of articles from every department of industry; of choice specimens of American ingenuity and skill; rare and valuable domestic productions, natural or artificial; the delicate and beautiful handiwork of females; useful labor-saving machines, implements of husbandry, and new models of machinery, in all their varieties.

Judges will be appointed to examine all articles offered, and the managers will award a gold or silver medal, or a diploma, to all articles that may be pronounced by the judges worthy of reward.

Articles intended for exhibition, must be delivered on or before Wednesday, September 13th.

Arrangements will be made to exhibit, *in operation*, any working models that may be offered, which will render the exhibition useful and interesting, and the managers respectfully invite contributions in this branch. A careful and competent superintendent will be appointed to take chare of all models sent for this purpose.

Board of Managers.

Stephen Fairbanks,	Jos. T. Buckingham,
John Rayner,	James Clark,
William Adams,	Henry W. Dutton,
Uriel Crocker,	George Darracott,
Gardner Greenleaf,	Wm. S. Pendleton,
James L. Homer,	Charles A. Wells,
James Barry,	Henry Bailey,
Joseph Tilden,	Jonas Chickering,
Ephraim Harrington,	Henry H. Barton,
Joseph Lewis,	Thomas Boyd,
Walter Frost,	Wm. Uunderwood,
Thomas J. Shelton,	George G. Smith,

John G. Rogers.

P. S. For any further information ad dress JAMES L. HOMER, Corresponding Secretary, Boston.

Boston, March 24, 1837. m28—ts1

TRANSACTIONS OF THE INSTITUTION OF CIVIL ENGINEERS OF GREAT BRITAIN.

The first volume of this valuable work, has just made its appearance in this country. A few copies, say *twenty-five* or *thirty* only, have been sent out, and those have nearly or quite all been disposed of at *ten dollars* each—a price, although *not* the *value* of the work, yet one, which will prevent many of our young Engineers from possessing it. In order therefore, to place it within their reach, and at a convenient price, we shall *reprint* the entire work, with ll its enagravings, *neatly done* on wood, and issue in six *parts* or *numbers*, of about 48 pages each, which can be sent to any part of the Unite l States by mail, as issued, or put up in a volume at the close.

The price will be to subseribors *three dollars*, or *five dollars* for two copies—*always in advance*. The first number will be ready for delivery early in April—Subscriptions are solicited.

FOR SALE AT THIS OFFICE,

A Practical Treatise on Locomotive Engines, with Engravings, by the CHEVALIER DE PAMBOUR—150 pages large octavo—done up in paper covers so as to be sent by mail—Price $1 50. Postage for any distance *under* 100 miles, 40 cents, and 60 cts. for any distance exceeding 100 ms.

ALSO—*Van de Graaff on Railroad Curves*, done up as above, to be sent by mail—Price $1. Postage, 20 cents, or 30 cents, as above.

ALSO—Introduction to a view of the works of the *Thames Tunnel*—Price *fifty cents*. Postage as above, 8 cents, or 12 cts.

*** On the receipt of $3, a copy of each of the above works will be forwarded by mail to any part of the United States.

AVERY'S ROTARY STEAM ENGINES.—AGENCY.—The subscriber offers his services to gentlemen desirous of procuring Steam Engines for driving SAW-MILLS, GRAIN-MILLS, and OTHER MANUFACTORIES of any kind.

Engines only will be furnished, or accompanied with *Boilers* and the necessary *Machinery* for putting them in operation, and an Engineer always sent to put them up.

Information will be given at all times to those who desire it, either by letter or by exhibiting the engines in operation in this city.

Inquiries by letter should be very explicit and the answers shall be equally so.

D. K. MINOR,
30 Wall-st., New York.

TO CONTRACTORS.

JAMES RIVER AND KANAWHA CANAL.

THERE is still a large amount of mechanical work to let on the line of the James River and Kanawha Improvement, consisting of twenty locks, about one hundred culverts and several large aqueducts, which will be offered to responsible contractors at fair prices.

The locks and aqueducts are to be built of cut stone.

The work contracted for must be finished by the 1st day of July, 1838.

Persons desirous of obtaining work are requested to apply at the office of the undersigned, in the city of Richmond, before the fifteenth of May, or between the fifth and the fifteenth of July.

CHARLES ELLET, Jr.
Chief Engineer Jas. Riv. & Ka. Co.

P. S.—The valley of James River above Richmond is healthy.

18—10t

PATENT RAILROAD, SHIP AND BOAT SPIKES.

*** The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent,) are found superior to any ever offered in market.

Railroad Companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails, to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

*** All orders directed to the Agent, Troy, N. Y., will be punctually attended to.

HENRY BURDEN, Agent.
Troy, N. Y., July, 1831.

*** Spikes are kept for sale, at factory prices, by I. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J. I. Brower, 222 Water street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes. (1J23am) H. BURDEN.

TO RAILROAD CONTRACTORS.

SEALED proposals will be received at the office of the Selma and Tennessee River Railroad Company, in the town of Selma, Alabama, for the graduation of the first forty miles of the Selma and Tennessee Railroad. Proposals for the first six miles from Selma, will be received after the first of May, and acted on by the Board on the 15th May. Proposals for the ensuing 34 miles, will be received after the 10th May, but will not be examined until the 1st of August next, when the work will be ready for contract.

The line, after the first few miles, pursuing the flat of the Mulberry Creek, occupies a region of country, having the repute of being highly healthful. It is free from ponds and swamps, and is well watered.—The soil is generally in cultivation, and is dry, light and sandy, and uncommonly easy of excavation.—The entire length of the line of the Selma and Tennessee Railroads, will be about 170 miles, passing generally through a region as favorable for health as any in the Southern Country.

Owing to the great interest at stake in the success of this enterprise, and the amount of capital already embarked in it, this work must necessarily proceed with vigor, and I invite the attention of men of industry and enterprise, both at the North and elsewhere to this undertaking, as offering in the prospect of continued employment, and the character of the soil and climate, a wide and desirable field to the contractor.

Proposals may be addressed either to the subscriber, or to General Gilbert Shearer, President of the Company.

ANDREW ALFRED DEXTER, Chief Engineer
Selma, Ala., March 20th, 1837. A 15 tf

ROACH & WARNER,

Manufacturers of OPTICAL, MATHEMATICAL AND PHILOSOPHICAL INSTRUMENTS, 293 Broadway, New York, will keep constantly on hand a large and general assortment of Instruments in their line.

Wholesale Dealers and Country Merchants supplied with SURVEYING COMPASSES, BAROMETERS, THERMOMETERS, &c. &c. of their own manufacture, warranted accurate, and at lower prices than can be had at any other establishment.

Instruments made to order and repaired. 14 1y

FRAME BRIDGES.

THE undersigned, General Agent of Col. S. H. LONG, to build Bridges, or vend the right to others to build, on his Patent Plan, would respectfully inform Railroad and Bridge Corporations, that he is prepared to make contracts to build, and furnish all materials for superstructures of the kind, in any part of the United States, (Maryland excepted.)

Bridges on the above plan are to be seen at the following localities, viz. On the main road leading from Baltimore to Washington, two miles from the former place. Across the Metawamkeag river on the Military road, in Maine. On the national road in Illinois, at sundry points. On the Baltimore and Susquehanna Railroad at three points. On the Hudson and Patterson Railroad, in two places. On the Boston and Worcester Railroad, at several points. On the Boston and Providence Railroad, at sundry points. Across the Contoocook river at Henniker, N. H. Across the Southegan river, at Milford, N. H. Across the Connecticut river, at Haverhill, N. H. Across the Contoocook river, at Hancock, N. H. Across the Androscoggin river, at Turner Centre, Maine. Across the Kennebec river, at Waterville, Maine. Across the Genesee river, at Squakiehill, Mount Morris, New-York. Across the White River, at Hartford Vt. Across the Connecticut River, at Lebanon, N. H. Across the mouth of the Broken Straw Creek, Penn. Across the mouth of the Cataraugus Creek, N. Y. A Railroad Bridge diagonally across the Erie Canal, in the City of Rochester, N. Y. A Railroad Bridge at Upper Still Water, Orono, Maine. This Bridge is 500 feet in length; one of the spans is over 200 feet. It is probably the FIRMEST WOOD BRIDGE ever built in America.

Notwithstanding his present engagements to build between twenty and thirty Railroad Bridges, and several common bridges, several of which are now in progress of construction, the subscriber will promptly attend to business of the kind to much greater extent and on liberal terms. MOSES LONG.

Rochester, Jan. 13th, 1837. 4—y

ALBANY EAGLE AIR FURNACE AND MACHINE SHOP.

WILLIAM V. MANY manufactures to order IRON CASTINGS for Gearing Mills and Factories of every description.

ALSO—Steam Engines and Railroad Castings of every description.

The collection of Patterns for Machinery, is not equalled in the United States. 9—1y

NEW ARRANGEMENT.

ROPES FOR INCLINED PLANES OF RAILROADS.

WE the subscribers having formed a co-partnership under the style and firm of Folger & Coleman, for the manufacturing and selling of Ropes for inclined planes of railroads, and for other uses, offer to supply ropes for inclined planes, of any length required without splice, at short notice, the manufacturing of cordage, heretofore carried on by S. S. Durfee & Co., will be done by the new firm, the same superintendant and machinery are employed by the new firm that were employed by S. S. Durfee & Co. All orders will be promptly attended to, and ropes will be shipped to any port in the United States.

12th month, 12th, 1836. Hudson, Columbia County State of New-York.

ROBT. C. FOLGER.
33—tf. GEORGE COLEMAN.

AMES' CELEBRATED SHOVELS, SPADES, &c.

300 dozens Ames' superior back-strap Shovels
150 do do do plain do
150 do do do cast steel Shovels & Spades
150 do do Gold-mining Shovels
100 do do plated Spades
50 do do socket Shovels and Spades.

Together with Pick Axes, Churn Drills, and Crow Bars (steel pointed,) manufactured from Salisbury refined iron—for sale by the manufacturing agents,

WITHERELL, AMES & CO.
No. 2 Liberty street, New-York.
BACKUS, AMES & CO.
No. 8 State street, Albany.

N. B.—Also furnished to order, Shapes of every description, made from Salsbury refined Iron. v4—tf

STEPHENSON,

Builder of a superior style of Passenger Cars for Railroads.

No. 264 Elizabeth street, near Bleecker street, New-York.

RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlaem Railroad now in operation. J25tf

TO RAILROAD CONTRACTORS.

PROPOSALS will be received, at the office of the Hiwassee Railroad Com., in the town of ATHENS, TENNESSEE, until sunset, of Monday, June 12th, 1837; for the grading, masonry and bridges, on that portion of the HIWASSEE RAILROAD, which lies between the River Tennessee and Hiwassee. A distance of 40 miles.

The quantity of excavation will be about one million of cubic yards.

The line will be staked out; and, together with drawings and specifications of the work, will be ready for the inspection of contractors, on and after the 1st day of June.

JOHN C. TRAUTWINE,
Engineer in Chief Hiwassee Railroad.
16—6t

RAILWAY IRON, LOCOMOTIVES, &c.

THE subscribers offer the following articles for sale.

Railway Iron, flat bars, with countersunk holes and mitred joints,

						lbs.	
350 tons	2½	by	½,	15 ft in length, weighing		4 44/100	per ft.
280 "	2	"	½,	"	"	3 40/100	"
70 "	1¼	"	½,	"	"	2½	"
30 "	1½	"	½,	"	"	1 88/100	"
90 "	1	"	½,	"	"	½	"

with Spikes and Splicing Plates adapted thereto. To be sold free of duty to State governments or incorporated companies.

Orders for Pennsylvania Boiler Iron executed.

Rail Road Car and Locomotive Engine Tires, wrought and turned or unturned, ready to be fitted on the wheels, viz. 30, 33, 36, 42, 44, 54, and 60 inches diameter.

E. V. Patent Chain Cable Bolts for Railway Car axles, in lengths of 12 feet 6 inches, to 13 feet 2½, 3 feet 3, 3½, 34, 3½, and 3¾ inches diameter.

Chains for Inclined Planes, short and stay links, manufactured from the E. V. Cable Bolts, and proved at the greatest strain.

India Rubber Rope for Inclined Planes, made from New Zealand flax.

Also Patent Hemp Cordage for Inclined Planes, and Canal Towing Lines.

Patent Felt for placing between the iron chair and stone block of Edge Railways.

Every description of Railway Iron, as well as Locomotive Engines, imported at the shortest notice, by the agency of one of our partners, who resides in England for this purpose.

A highly respectable American Engineer, resides in England for the purpose of inspecting all Locomotives, Machinery, Railway Iron &c. ordered through us.

A. & G. RALSTON & CO.,
28 tf Philadelphia, No. 4, South Front st.

ARCHIMEDES WORKS.

(100 North Moor street, N. Y.)
NEW-YORK, February 13th, 1838.

THE undersigned begs leave to inform the proprietors of Railroads that they are prepared to furnish all kinds of Machinery for Railroads, Locomotive Engines of any size, Car Wheels, such as are now in successful operation on the Camden and Amboy Railroad, none of which have failed—Castings of all kinds, Wheels, Axles, and Boxes, furnished at shortest notice.

4—v1f H. R. DUNHAM & CO.

MACHINE WORKS OF ROGERS,

KETCHUM AND GROSVENOR, Paterson, New-Jersey. The undersigned receive orders for the following articles, manufactured by them, of the most superior description in every particular. Their works being extensive, and the number of hands employed being large, they are enabled to execute both large and small orders with promptness and despatch.

RAILROAD WORK.

Locomotive Steam-Engines and Tenders; Driving and other Locomotive Wheels, Axles, Springs and Flange Tires; Car Wheels of cast iron, from a variety of patterns, and Chills; Car Wheels of cast iron, with wrought Tires; Axles of best American refined iron; Springs; Boxes and Bolts for Cars.

COTTON WOOL AND FLAX MACHINERY,

Of all descriptions and of the most improved Patterns, Style and Workmanship.

Mill Gearing and Millwright work generally; Hydraulic and other Presses; Press Screws; Calenders; Lathes and Tools of all kinds; Iron and Brass Castings of all descriptions.

ROGERS, KETCHUM & GROSVENOR
Paterson, New-Jersey, or 40 Wall street, N. Y.
3tf